Occupational HAZARDS

AUG 1 0 1948

THERE'S PROFIT IN PREVENTION

AUGUST
1948

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ROUTE TO
YOUR PLANT
E PROTECTION
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ECTION ON
E PROTECTION
R INDUSTRY

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Cost of Infections $39.04

SEE PAGE 16

IN THIS ISSUE:

THE MODERN X-RAY AND T. B.
. . . SPONTANEOUS IGNITION . . .
CHECKING INDUSTRIAL VISION

Greater power savings justify higher initial cost..

BRASS FOUNDRY RE-ORDERS KIRK & BLUM DUST COLLECTING SYSTEM ON BASIS OF 20 YEARS' EXPERIENCE...

at SCHULTE BRASS MFG. CO., Cincinnati, Ohio

Buying on a competitive bids system, this manufacturer of cast brass bathroom accessories and fixtures checked every feature of proposed dust collecting systems. After rechecking and consideration of the notable 20-year service record of an existing Kirk & Blum Polishing and Buffing Dust Collecting System, *Kirk & Blum was selected again.*

The new system, cyclones for which are shown above, proved again that efficient design by Kirk & Blum Engineers gave power savings that more than offset higher initial cost, even over a short period of time.

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KIRK AND BLUM

DUST CONTROL SYSTEMS

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Chinese "Goddess of Mercy"
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[1]"Chinese Jades" by Stanley Charles Nott, international authority on Chinese jade, and Director of Oriental Art, Norton Gallery and School of Art.

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There is Nothing Finer For All General Occupational Skin Cleansing

PAXLANOSAV*—a superior skin emollient combining lanolin and other special skin normalizers.

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G. H. PACKWOOD MANUFACTURING CO.
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*Tradename of G. H. Packwood Mfg. Co.

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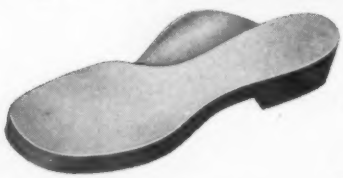
for the worker with

tired feet

No. 1320 Sizes 5 to 12 Widths D and E

The FIRST Safety Shoe with these three Fatigue-Eliminating features:



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Extends forward under arch adding strength and support. Helps to prevent weakened ankles from "rolling inward"...common with pronated arches. Full-height shoe also gives extra ankle support.

SEAMLESS QUARTER!
New, comfort-construction...effectively eliminates heel chafing, prevents leather tearing at back.

In every plant, a certain number of workers continually complain of hurting feet. Many refuse to wear ordinary safety shoes that lack the *extra* arch and ankle support necessary for their comfort. Here, for the first time, is a safety shoe that combines these essential Fatigue-Eliminating aids—Arch Supporting Insole, Orthopedic Heel (ankle and arch support), and Seamless Quarter! It enables you to put 100% of your workers in safety shoes! Typical of Lehigh's unique service supplying industry with special shoes to lick special problems.

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A Division of the ENDICOTT JOHNSON CORPORATION
SAFETY SHOE COMPANY
ALLENTOWN, PA.
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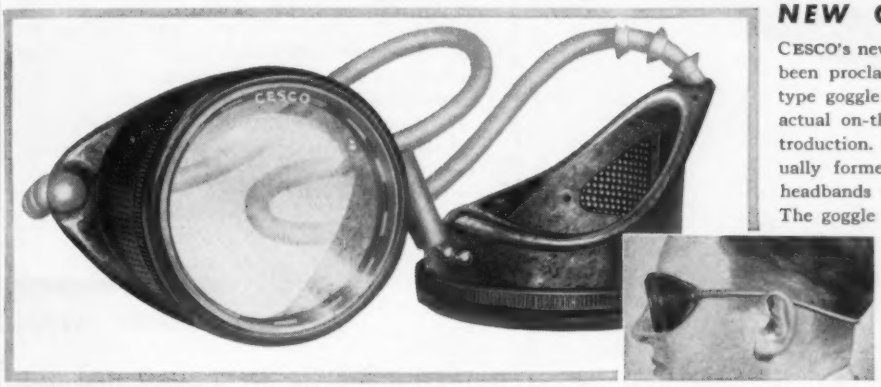
NEW CESCO GOGGLES

3 Advancements in Eye Protection that Greatly Reduce Accident Costs

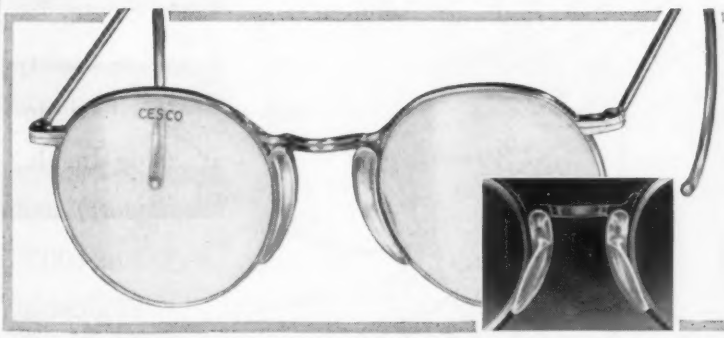
This message points the way toward the reduction of eye injury costs. The 3 CESCO goggles shown below represent improvements that work 3 important ways in preventing accidents.

First, these 3 goggles excel in every safety feature. Second, they emphasize wearer comfort that assures constant use. Third, they are constructed to give steady, long-lasting service.



NEW CUP-TYPE GOGGLE

CESCO's new **No. 545-C** Chippers Goggle has been proclaimed the most comfortable cup type goggle yet developed. That's based on actual on-the-job tests made before its introduction. Contour engineering of individually formed eye cups plus Comfort-King headbands eliminates all wearing pressure. The goggle fits naturally and snugly in protective position. Its sturdy construction, exclusive ventilation feature and adjustability add to its safety and comfort merits.



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DOES NOT STING

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Samples and brochure sent upon request.

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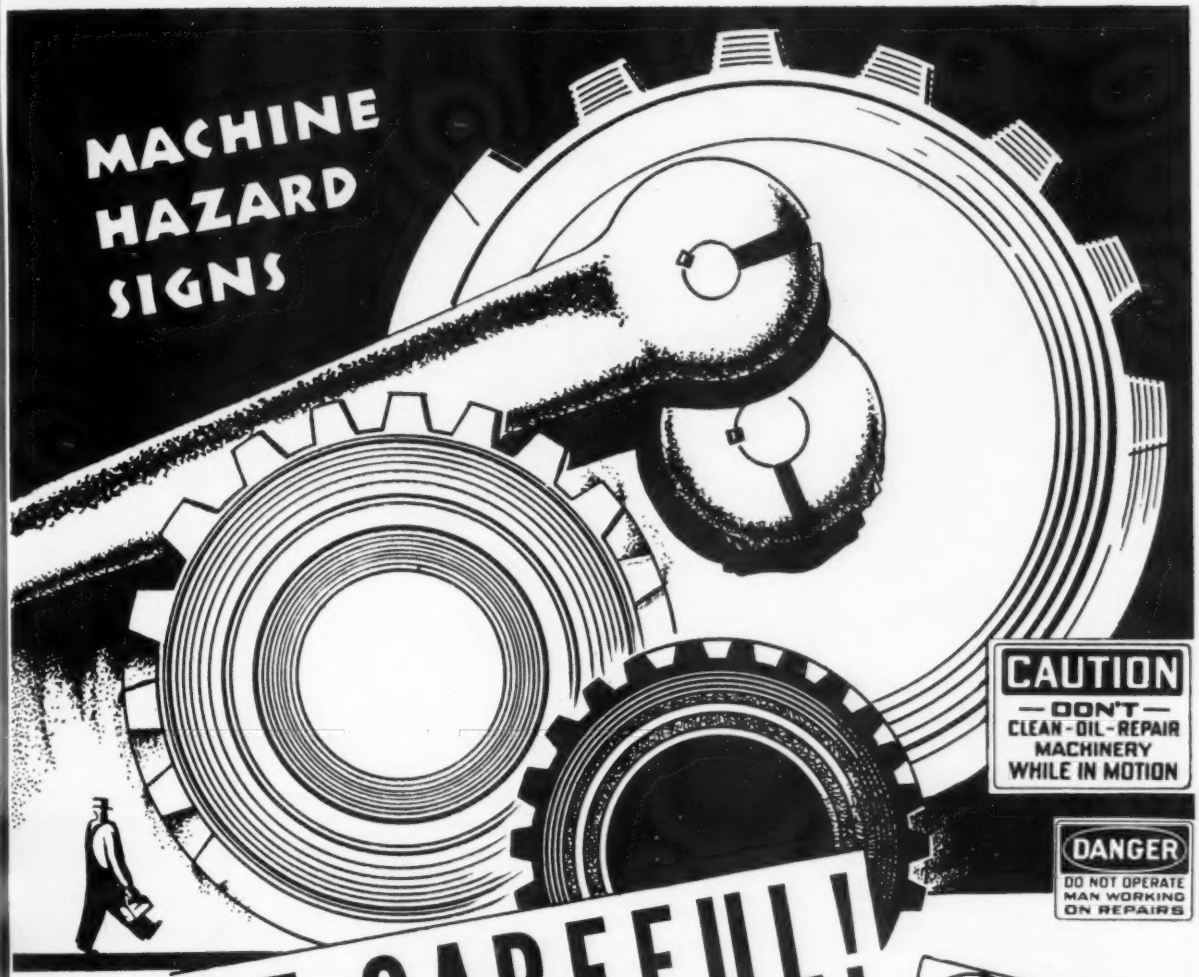

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But they can't think. That's why Machine accidents occur ... unless the men who operate them do the thinking.

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help to prevent machine accidents by urging men to be careful on or around machinery ... to THINK!

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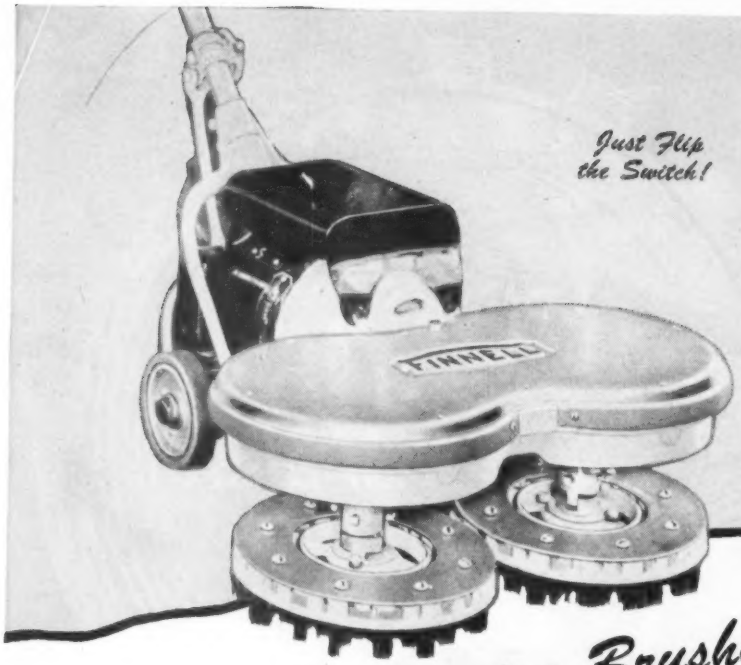

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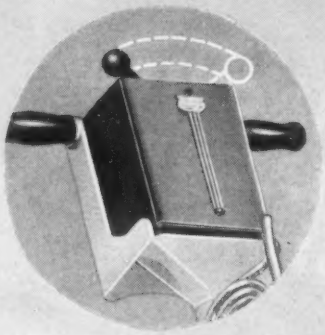

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FURTHER THE ECONOMY OF MECHANICAL DRY SCRUBBING

The *Finnell 84-XR* provides mechanical dry scrubbing at its labor-saving best! That is due partially to the fact that this dry scrubber eliminates the need for frequent changing of brushes by hand in order to maintain a good cutting edge. *A flip of the switch* reverses the motion of the brushes and re-sharpens them automatically . . . *while working!*

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Finnell offers a complete line of *Floor-Maintenance Equipment*, including a *Heavy Duty Vacuum* for wet and dry pickup . . . also *Cleansers, Sealers, Waxes,* and *Accessories* of every requisite type. And the nearby *Finnell man* is readily available for training your maintenance operators in the proper use of *Finnell* equipment and supplies.

For consultation, free floor survey, demonstration, or literature, phone or write nearest *Finnell* branch or Finnell System, Inc., 3508 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

Everything FINNELL for Floor Care

Heavy Duty Vacuum for Wet and Dry Pickup

FINNELL SYSTEM, INC.

Pioneers and Specialists in

FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

Occupational HAZARDS

VOLUME 10 • No. 10

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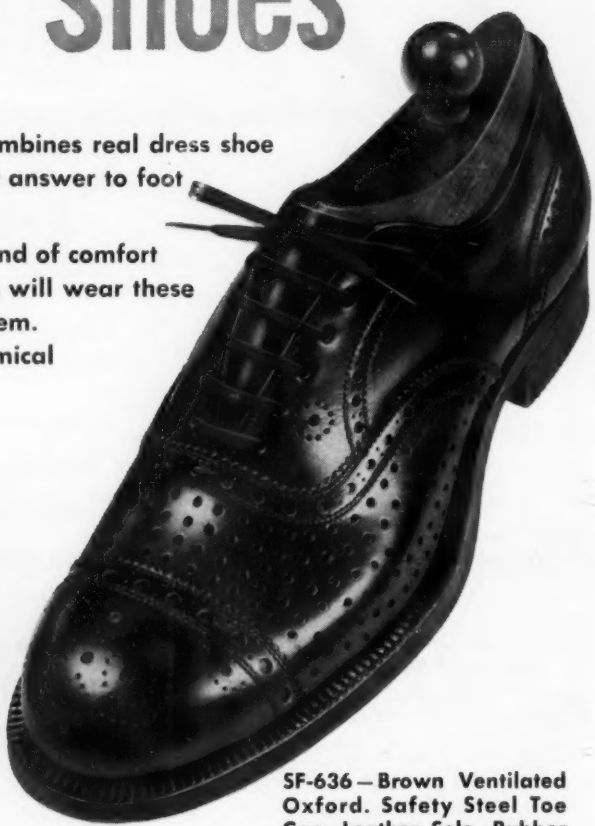
NOW! Two entirely new safety shoes

Entirely new! Entirely different! Thom McAn combines real dress shoe style with safety shoe protection. It's the perfect answer to foot safety plus cool comfort.

Here are not only new good looks, but a new kind of comfort and new flexibility as well. That's why workers will wear these safety shoes both on and off the job—and love 'em. Best of all, they are sold at the same old economical Thom McAn prices.

SF-635—Brown Woven Blucher Oxford. Safety Steel Toe Cap. Leather Sole, Rubber Heel. C 7½-11; D 6-12; E 6-11.



SF-636—Brown Ventilated Oxford. Safety Steel Toe Cap. Leather Sole, Rubber Heel. C 7½-11; D 6-12; E 6-11.

Sold Direct to Plants

$7.15 net. F.O.B. Worcester, Mass. Purchases up to 48 prs.—straight list price. 5% discount on orders of 48 to 144 prs. 10% discount on orders of 144 prs. & over.

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Thom McAn Safety Shoe Division
44 Hammond St., Worcester, Mass.

THOM McAN — THE SHOE EVERYBODY KNOWS AND ALMOST EVERYBODY WEARS

IDLE WORK-HANDS *play costly tunes . . .*

Skilled hands, temporarily incapacitated, are responsible for millions of dollars in industrial losses every year. Skin ailments, resulting from frequent exposure to industrial irritants plus the use of caustic washing soaps, are sour notes which throw production schedules off-key through excess absenteeism. Your plant is no exception in requiring safeguards against these dangers.

West's Lan-O-Kleen hand cleanser, superfatted with a high content of lanolin, plays an important part in a dermatitis prevention program. Made of fine corn meal, containing no harsh, gritty substances or excess alkali, Lan-O-Kleen thoroughly yet gently removes stubborn dirt, grime and grease from sensitive skins. In addition, it has beneficial emollient properties resulting from superfatting with lanolin.

Decide now to adopt the Lan-O-Kleen wash-up habit in your plant. Consult one of West's country-wide staff of sanitation specialists. He'll be glad to give you further details.

WEST LAN-O-KLEEN HAND CLEANSER

SAVE SOAP AND YOU SAVE EXTRA MONEY!

A modern, economical Lan-O-Kleen Dispenser regulates the amount of soap used—*prevents costly waste.* Readily adaptable for Bradley Fountains.

Send for this handsomely illustrated folder. It contains details of the dispenser, the healthful cleansing action of Lan-O-Kleen and complete washing instructions.

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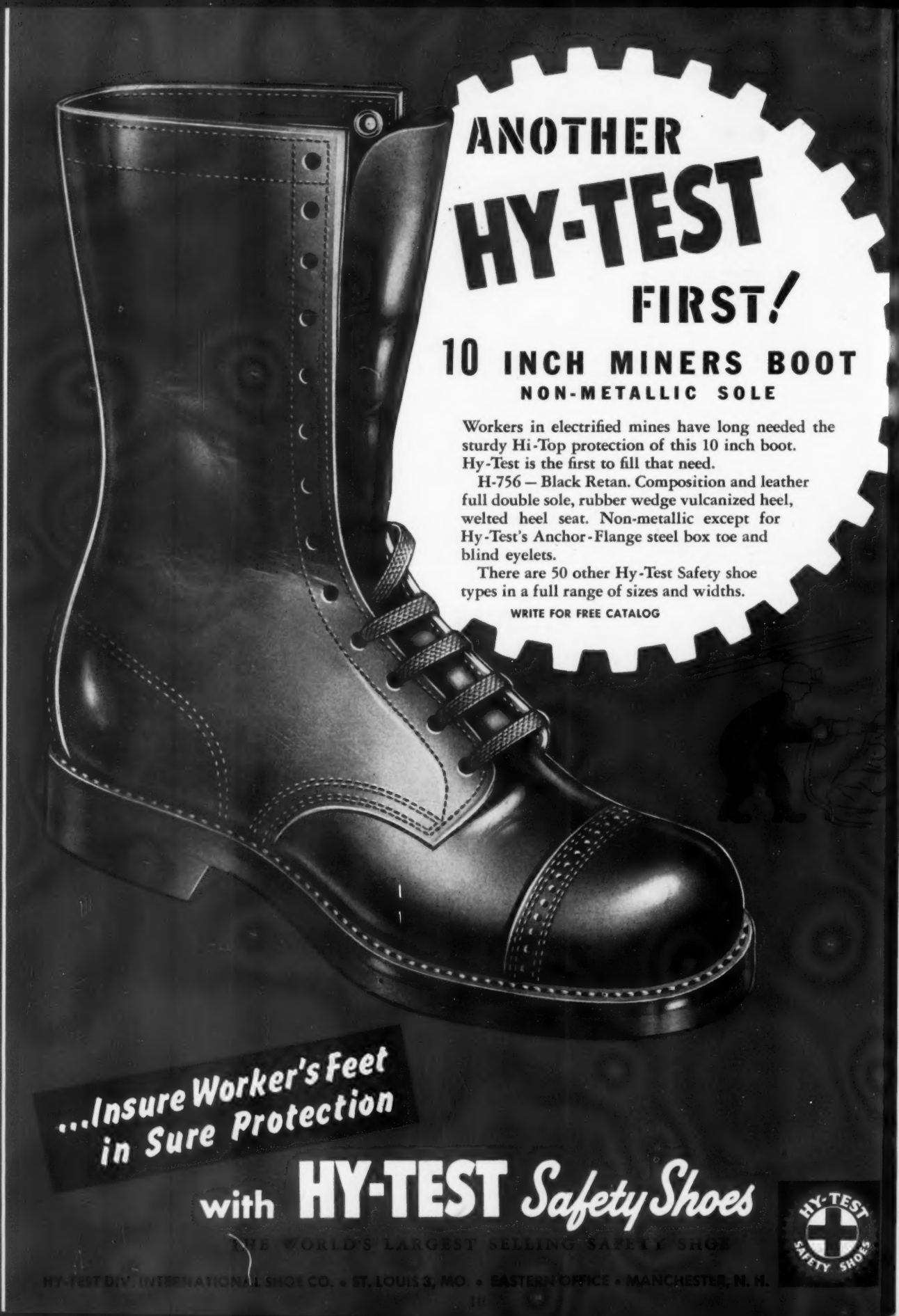
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Workers in electrified mines have long needed the sturdy Hi-Top protection of this 10 inch boot. Hy-Test is the first to fill that need.
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OCCUPATIONAL HAZARDS

AUGUST 1948

SUGGESTION SYSTEM FOR SAFETY

by W. L. SHIMER
Personnel Division
General Electric Company
Schenectady, N.Y.

Is your safety program lagging? A suggestion system to stimulate employee interest in plant safety could very well solve your problem. Read this article on how such a program is organized.

THE suggestion system at General Electric was set up to provide an orderly method of submitting and considering ideas and recommendations from employees to provide means for recognizing and rewarding individual ingenuity and to promote cooperation.

One of its most important effects in addition to these, has been the encouragement of employees to think along Safety lines and to suggest means of eliminating existing hazards.

The plan is administered by a group known as the "Suggestions Committee" which acts in an advisory and policy-making capacity and coordinates the activity of the six operating departments of the company.

Although the detail operation may vary at different plants depending on local conditions, the basic policy is the same.

Supervisors are considered as key people in the promotion of this activity. They are close to the factory workers and are in a position to convey the thinking of the plant management to them on the suggestion system. Educational programs are used to keep the foremen informed, and to point out how their particular operations may be improved by active employee participation.

Proper investigation of suggestions is also important. An idea is considered to have merit until facts prove it otherwise. As added assurance that a suggestion is not turned down which may have merit, each suggester is personally interviewed.

To publicize the system, stories of outstanding suggestions are printed in the company employee publication, along with pictures of suggesters. Suggestion award winners are reported over local radio stations and in local papers, and suggestion box posters are changed monthly.

Although the suggestion and safety activities are administered by two separate committees, the tie between the two is very close. The need for close coordination between these two groups has been recognized, and the man in charge of plant safety is a member of the suggestion committee. This arrangement has had very desirable results, since it has fostered a safety consciousness in the Suggestion Committee and a suggestion consciousness in the safety group.

Safety Suggestions in many instances are submitted by persons who are not exposed to the hazards which they report. For example, in one section, carboys of acid are emptied which weigh approximately two hundred pounds. Treadle type pumps were available but were too slow and the operators would not use them.

The alternative was for two men to lift and empty a carboy by hand: This procedure was permissable as long as proper wearing apparel was worn and the correct lifting instructions were followed.

One of the employees in this area sensed the possibility that some individual, through carelessness, might not follow the proper lifting instructions and receive a serious injury. He designed a compact hand pump arrangement with the necessary safety valves and with which one man could empty a carboy in about three minutes. After very thorough tests the equipment was found to be very practical and was adopted.

This suggestion eliminated a condition which was very annoying, besides greatly improving the morale of the employees doing this particular work.

In the evaluation of safety suggestions the seriousness of the hazard, the number and frequency of persons who may be exposed to it, and other factors are considered. The Committee granted a cash award for the carboy-pump idea.

At least reasonable success has been obtained in getting employee support for the safety program through the use of suggestions. During the past year approximately 25 per cent of the total suggestions submitted pertained to safety ideas. Better than 1/3 of these were adopted. Although there is no way of knowing what would have happened if these ideas had not been submitted, the suggestion system has been of very definite help in putting across the Company's safety program.

"Management wants to know what the. . . .

CORRECTING VISUAL DEFICIENCY IN INDUSTRY

By ROBERT FOSTER ASH
Optometrist
Visual Consultant
International Business Machines

INDUSTRIAL psychologists, oculists and optometrists have stressed the importance of correcting visual deficiency in industry and, through their work, have further established its significance as a research problem.

While good vision is not the panacea of all industrial problems it is important. There is no excuse today for industry being uninformed concerning the visual abilities of all workers. It can be done at reasonable cost and with a minimum loss of time from the job. Several optical manufacturers supply well planned programs, including testing instruments. I think there is little to choose between instruments but the programs do vary. You must decide which one best meets the objectives you wish to accomplish.

Management wants to know what the worker can do with his eyes and *for how long*. In many plants the responsibility for sharpening the visual tools is often left to the workers themselves. Yet many workers are remiss in taking the necessary precautions to protect and conserve their sight. The average worker does not think of his eyes until he has blurred vision, headaches, or until he loses a finger. Not infrequently, even with such warnings, workers fail to obtain professional eye care until there has been a serious impairment of vision.

The object of any eye program certainly should not be to place, promiscuously, more glasses astride more noses but we must not lose sight of the fact that the need for corrective glasses in industry is constantly on the increase. According to the Better Vision Institute, an unbiased organization dedicated to promoting better visual environments, 70% of American workers would be benefitted by wearing corrective glasses. The Association for Prevention of Blindness has long concurred with this opinion.

The emphasis of most visual programs is placed on production. We feel that production will inevitably reflect our efforts if we gear our program to safety, personal comfort and welfare of the workers. We want managers and men to feel that this is another company service to them not because we say it is but because we do things for them that make them feel that it is.

Here is our thinking. Visual surveys are informative —tremendously so. Statistics are important. We certainly want to do correlations, particularly between vision and safety. We want to generalize some. But in our enthusiasm for data we must not forget just why we run a survey; that our only objective is to see what visual apparatus Joe Brown in drill press has to help him do a day's work safely, efficiently and comfortably.

Our idea is to give Joe most of the attention. If he has good eyes we should tell him. He's proud of those

. . . .worker can do with his eyes and *for how long*"

eyes and a word from us substantiating his opinion will please him. If he is developing a visual problem that may become serious we should tell him about that, too. If it has already caught up with him we should impress upon him the importance of seeking professional advice and visual aids from some one of his own choosing. By all means, everyone taking the tests should receive a report.

We no longer concur with the prevalent practice of "Screening out" workers on the basis of pass or fail standards. The term itself, "screening out" is a misnomer in that it implies some inferiority or physical deformity. The need for glasses in our present close work environment is no more a sign of physical inferiority than the need for dentures brought about by our eating soft foods or the fact we wear shoes because we walk on hard surfaces. All these accessories simply assist the individual to adapt himself to a more advanced civilization.

The sooner we can take the stigma out of *failing* something, the sooner we will have the cooperation of the workers and the closer we will be to having our plants working at each man's top potential visual efficiency. In no case should a worker be told that his visual performance is not up to the required standard for his department. That again indicates inferiority.

International Business Machines has been particularly active in finding places for the physically handicapped. Thomas J. Watson, President of I B M, instituted this policy in the Endicott plant as early as 1914. The plan has been so successful that more than 300 persons in this classification are now employed.

Blind, legless, armless, deaf, mute, and spastic workers are working the regular 40-hour week on all types of intricate jobs. Their efficiency is consistently high and they are taking home the same pay as their fellow workers get for the same type of job.

Michael Supa, totally blind since early babyhood, is director of handicapped personnel.

What does this mean? It means that we believe there is a place in industry for workers with physical handicaps *as long as we are aware of them.*

Because of this company policy we do not use predetermined industry-wide visual job requirements. We prefer to deal with each worker as an individual human being. We prefer to analyze and interpret his visual findings within the plant, with his own I B M job in mind. If he needs help we try to motivate him to seek it on the basis of his own personal welfare.

The job dictionary lists some 25,000 operations from the classic crane operator with his need for superior distance skills to that prototype of all close work—the hosiery louper—who works at the end of her nose. In between these are perhaps a dozen visual job families.

Man's greatest visual task is focusing and converging his eyes simultaneously and harmoniously upon a given point. If he has no visual interferences, what he does with his eyes at that point makes little difference. He can peel potatoes, assemble fine parts or operate a punch press for hours on end without discomfort.

This being true, we see no advantage in having a worker visually adequate to do one job but not another. Our goal is to have each worker at *his* top potential visual efficiency in the plant, driving his car, and at home. That doesn't mean every one will have perfect eyes. It simply means he will be as efficient as professional aids can make him.

You may conclude from this that every other worker is being referred for eye care. On the contrary, only 14% are being referred for immediate attention. In fairness to other plants and other programs I must state that 50% of all I B M workers are already wearing corrective glasses obtained through their own volition.

Now, a few words concerning the practical application of our program. One week before we take the tests, a member of the safety department and I visit the man-

(Please turn to page 35)

SMASHING T. B. WITH MASS X-RAYS

By DR. C. J. FERNALD
Washington, D. C.

Tuberculosis can be cured . . . if found in its early stages. This article is about a mass X-ray program that works. It is a program that should be established throughout industry.

WASHINGTON, D. C., is doing something which is expected to take tuberculosis out of the occupational disease picture of the Nation's Capital. The city hopes by mass photography to locate all cases of tuberculosis and to provide treatment while the frequently-unsuspecting victim is still in the easily-curable stage. The program which is expected to do this is simple, is free, is without the embarrassment of disrobing for an examination, and it takes only a minute of each person's time. But if final results are as promising as is presently indicated, the program being tried out experimentally is one which may later be included in the health program of every major community. It may lead to the almost complete elimination of tuberculosis.

Already over 95 communities have made inquiry about the Washington experiment, and several have indicated that they plan to carry on similar work. O. C. Billows, statistician with the United States Public Health Service, who is assistant director of the Washington survey, says that arrangements have already been completed to start a similar campaign in Cleveland in September. It is understood that plans for a similar survey in Boston, Denver, San Diego and other cities is receiving serious consideration by local health groups.

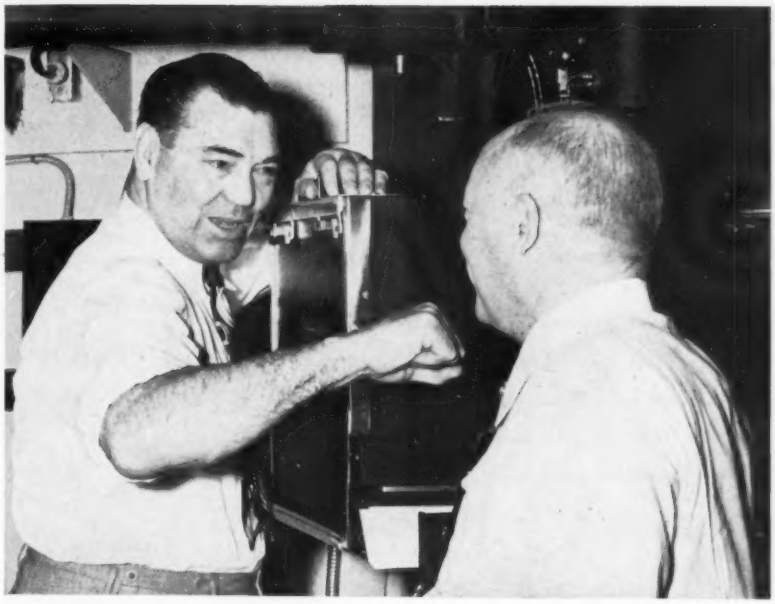
Tuberculosis is curable if recognized early enough but it is very infectious. Like typhoid and diphtheria, twin killers of the past that have now been almost completely eliminated, tuberculosis has and always must travel from the sick to those who are well but less resistant. It causes so little trouble to the diseased person during the early stages that the newly infected seldom ever believe that they are really diseased. It is at this early stage that the infection must be spotted if it is to be completely eliminated, otherwise it will be impossible to prevent transfer of the disease from one person to another.

Until recently there has been no way to easily, cheaply, and scientifically diagnose large masses of workers in industry so that the disease may be detected in its earlier stages. Under most voluntary health programs we seldom found the person who, though infected, was not sick enough to complain. Yet without care, this early-stage case may rapidly pass into the incurable stage. Unrecognized, he not only continues to deteriorate physically, he passes on his disease to those about him.

Now, under USPHS methods being tried experimentally in Washington, it is being shown that a photofluorographic examination of a clothed subject can screen the troubled chest and find those two-to-five cases in each hundred who are suspects. Then these findings can be further confirmed by taking a 14x17 X-ray which will reveal further evidence needed for specific diagnosis. Through these screening examinations, the unsuspecting tubercular patient can be directed back to health.

The screening, then, becomes a key that—while preventing others from getting the patient's infection—gives him warning soon enough to save his life.

In this Washington drive where already about 400,000 chests have been X-rayed—about 100,000 per month—the slogan is "Check your chest! Get your free X-ray today." To give Washington's citizens an opportunity to obey the command, a dozen mobile and portable X-ray units have been shuttled about among the larger stores, government departments, and other centers of employment. Lineups at such cen-



Jack Dempsey illustrates the "knockout punch" for T. B.
(Reni Photos)

ters make it possible to take a picture a minute or more. Each employer is rewarded by getting on an honor roll if each person in his employe has his or her chest X-rayed.

The city already had, when the present campaign started, the records of its indigent, of many government workers, of local army recruits —almost a half-million X-rays on file. Added to these the over 400,000 taken during the first four months of the current drive, and Washington has almost a million chest films. When the scattering remainder is cleaned up, it is hoped that the city can keep its "all-chests-x-rayed" 100% by having its hospitals X-ray all patients who enter the hospital for any purpose, *and to persuade the city's larger employers to X-ray the chests of new employees just as they now take occupational histories of new workers.* There is no question as to the great value to business in general and the health of the city if all plants kept a record of each worker. The army and navy have both found that such records were of such value that today all recruits are X-rayed.

The whole drive is planned to cover approximately six months. In this time new infections are not likely to do much damage to the shop, home or community, and by the time it is completed the city will know every danger spot and be able to take steps to eliminate them. If the goal of 100 percent cooperation can be gained, Washington believes it can reduce tuberculosis from its present position as third-largest cause of death to a level lower than those other community infections—diphtheria, small pox and typhoid—now seldom encountered because of successes in preventive medication.

It is estimated that in Washington the drive is likely to save directly one or two lives each day, while helping many others indirectly by removing sources of infection or revealing other chest ailments. If successful, the drive will bring about a longer earning-life for the worker and enable them to do a better job while employed. Through a pleasanter life, it will provide a longer period for the worker to enjoy the fruits of his increased earning power.

The drive was first thought up in 1946, after observing its successful use by the army medical corp. In January, 1948, it was launched citywide. The USPHS brought in portable and bus units and some stationary X-ray equipment. To open the campaign, Surgeon General Parran, Dr. Rhuland of the District health department, and Mrs. Lowe of the Tuberculosis Association were publicly X-rayed.

Units used in the actual screening of Washington's population are from General Electric, Westinghouse, and the Picker Manufacturing Company. All varieties use the Fairchild camera, but otherwise the various units have convenient devices which differentiate them and account for the variation in price of equipment. Most of the units cost between $6,000 and $11,000 — *prices which might be attractive to large industrial concerns planning to keep these units as permanent parts of their employee health program.*

In the actual taking of the X-ray, an identity card containing the subject's name and an asssigned number is fitted into the machine simultaneously. The machine is so adjusted that it can not take one X-ray until the identity of the predecessor-subject has been removed and the new card fitted into the slot.

The film used is almost universally Eastman or DuPont, and the rolls are 100 feet in length, enough to take 360 pictures. If only one or a very few X-rays are to be taken at one time, the film can be cut.

At headquarters all the thousands of films from the various units are carried daily and developed. Here, too, are taken the identity cards, kept in order with the roll of film. If, on examination, the X-ray indicates any possibility of chest trouble, the card is immediately so marked, and the subject notified to return for a larger check film.

The examination of the X-rays is performed by doctors specifically trained in the examination and interpretation of chest-films. In examining the films, they use a magnifying viewer box which blows up the film two or three times. The doctor handles the film and the identity card simultaneously, and records on

(Please turn to page 35)

Here's a study that furnishes a yardstick in computing cost of injuries...

HOW DO YOUR COSTS COMPARE WITH THESE?

Part 6

Infections . . . $39.04

Here is the sixth and concluding article of the series OCCUPATIONAL HAZARDS magazine has been running on Paul Windsor's "Cost of Accident" report—the four-year cost-study of 3,853 industrial injuries at Le Tourneau, Inc. These important figures have been exclusively released to you by OCCUPATIONAL HAZARDS, the magazine that proves "There's Profit in Prevention!" Here, for instance, is conclusive proof that good first aid equipment is cheap insurance against costly infections.

MR. WINDSOR, the director of safety at the Peoria plant of Le Tourneau, Inc., states in his report that sample studies were made in most type of injuries. Cases were chosen at random at various times over the four year period covered by the report. This was the case in determining actual cost to the employer of infection cases. On all such cases included in the report, a safety engineer actually timed nurses attending infection cases and timed the patient waiting for treatment, total time away from his job, etc. An attempt was made by Mr. Windsor to determine the cost to the employer in continuing the wages of the injured worker in full while the worker was recovering from infection, even though the worker may, for a time, be worth much less than his normal value. The information was found to be incomplete and subjective and so was not used in the final cost figures. The only figures used in the report are those that are reliable beyond doubt and substantiated.

The infection cases included in Paul Windsor's study results from lacerations, punctures, and burns. Forty-five per cent of the cases were finger injuries, twenty per cent of the cases involved the hand while the remainder were injuries of the arms and legs. Collected data indicated that an average of 5.3 calls were made on each case on the employer's time. The average time lost for the first call was 30.3 minutes and the total time lost by all calls on employer's time was 158.5 minutes. Sixty per cent of the cases show absence from work because of the infection.

The study also revealed that an average of 43.2 minutes were spent by the nurse on each infection case. Services of the company doctor were used from one to 10 times in 65 per cent of the cases. The remainder of the infection cases were first aid

(Please turn to page 38)

TABLE 100 — COSTS IN DOLLARS, TO THE EMPLOYER, OF INFECTIONS

Dept. No.	Time Lost By Employee	Overhead	Administration	Medical Expense								Compensation	Disability	Grand Total Cost
				Nurse's Time	Doctor's Services Excluding Operations Casts	Operations Sutures Casts, etc.	Medicine and Bandage	X-rays	Hospital	Transportation	Total			
058	$2.59	$4.95	3.98	$.814	$15.50	.....	$.312	.....	$43.20	$.85	$60.68	$42.81	.....	$115.01
053	6.05	11.66	3.98	.754	5.00	7.08	.144	.05	50.41	.85	64.29	12.59	.....	98.57
157	8.80	16.96	3.98	1.839	9.50	.....	.720	.....	36.65	.....	48.71	15.11	.....	93.56
103	1.98	4.85	3.98	.214	3.00	7.08	.072	.....	52.74	.....	63.11	12.59	.....	86.51
220	4.15	8.01	.2775	.394	3.00	7.08	.144	.....	40.73	.....	51.35	.....	.....	63.79
066	2.11	4.07	3.98	.214	3.00	7.08	.072	.....	40.39	.....	50.76	.....	.....	60.92
072	3.58	7.07	3.98	.334	6.50	.....	.120	.....	31.83	.....	38.78	.....	.....	53.41
109	12.10	29.61	.2775	1.474	6.50	.....	.504	.....	.....	.....	8.48	.....	.....	50.47
112	.42	.93	3.98	.334	6.50	.....	.120	.....	22.98	.....	29.93	10.08	.....	45.34
102	9.46	23.15	2.775	.454	8.00	.....	.168	.....	.....	.....	8.62	.....	.....	41.51
120	.33	.63	3.98	.214	3.50	.....	.072	.....	25.39	.....	29.18	.....	.....	34.12
123	.....	.....	3.98	.514	6.50	.....	.192	.....	.....	.....	7.21	.....	.....	11.19
112	2.81	6.30	.2775	.394	.....	.....	.144	.....	.....	.....	.55	.....	.....	9.94
216	1.77	3.97	.2775	.334	2.00	.....	.096	.....	.....	.....	2.43	.....	.....	8.45
083	2.20	4.24	.2775	.274	.....	.....	.096	.....	.....	.....	.37	.....	.....	7.09
083	1.06	3.39	.2775	.334	.....	.....	.120	.....	.....	.....	.45	.....	.....	5.18
213	1.25	2.80	.2775	.214	.....	.....	.072	.....	.....	.....	.29	.....	.....	4.62
110	1.25	2.80	.2775	.094	.....	.....	.024	.....	.....	.....	.12	.....	.....	4.45
058	.92	1.77	.2775	.094	.....	.....	.024	.....	.....	.....	.12	.....	.....	3.09
103	.33	.81	.2775	.094	.....	.....	.024	.....	.....	.....	.12	.....	.....	1.54
Average	$3.16	$6.90	$1.93	.47			.16				$23.28			$39.94

AO 5X138 GLOVE — Steel stapling includes (1) Index finger to crotch of thumb (2) Second, third and fourth fingers to palm (3) Thumb patch. All seams on face of glove steel sewed. 4 inch gauntlet.

AO 1674 MITTEN — There's DOUBLE the wear from this reversible mitten which may be worn on either hand. All seams steel sewed.

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The 5X138 Glove, 1674 Mitten and 1201 Hand Pad shown, are typical of the AO line of Steel-Stapled products for handling rough stock such as steel sheet, scrap, wheel castings, etc. Steel stapling at vulnerable places makes them almost as tough as the materials they handle. In design they offer everything possible for flexibility and comfort in durable chrome-tanned cowhide. Your nearest AO Safety Representative has these *proven-in-use* products.

American Optical COMPANY — *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

"Joe Spang, Jr.," a symbol of safety, stands in plain sight of the main entrance gate.

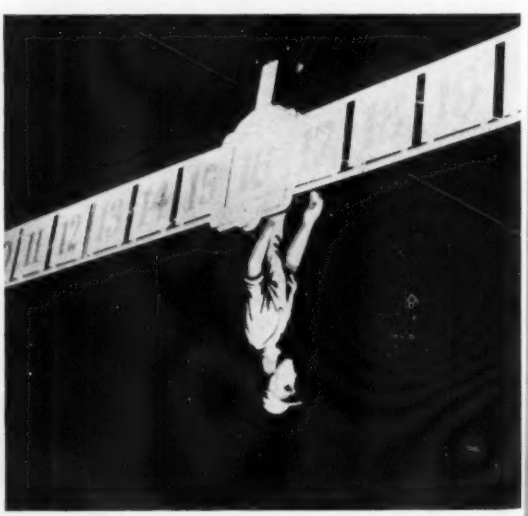
DRAMATIZING A SAFETY PROGRAM

FORCIBLY calling attention to every lost-time accident at the Ambridge, Pa. plant to The National Supply Company's Spang-Chalfant Division, where Seamless Steel Pipe is manufactured, "Joe Spang, Jr.", a symbol of safety, stands in plain sight of the main entrance gate of the plant. That is to say, he stands as long as there is no lost time acident.

Whenever a lost-time accident occurs Joe is upset from his perch above the date line and hangs head down until the following day. The date is blacked out, however, for the remainer of the month, and on each black plate a terse message such as, "The Upsetting fellows knocked out my props today", indicates the department in which the accident occurred or how it happened.

A decided improvement in accident frequency toward the end of 1947 may be attributed to the plant publicity given to Joe Spang, Jr., during the Fall months when plans for dramatizing a safety program were being made. A further means of keeping employees informed of their safety record is a bulletin board at one end of the frame tranversed monthly by Joe. This gives the year's record up to date and shows the departments in which lost-time accidents occurred. A large signboard alongside of the bulletin board (not shown in the above picture) is also part of the Spang-Chalfant safety campaign.

Whenever a lost time accident occurs "Joe Spang, Jr." is upset from his perch for a day.



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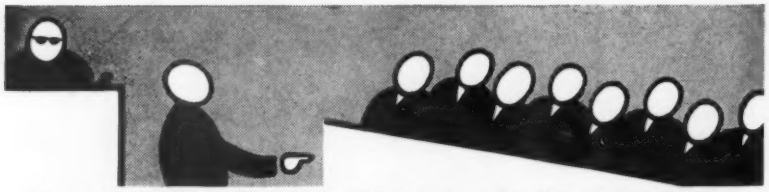

RIGHT OFF THE DOCKET

The trend of litigation on workmen's health and accident compensation is reflected in these briefs on the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist. Clip cases and file for future reference.

Minor Son Driving Company Truck

WILLARD HARRIES at the time of his death was the general superintendent in charge of a building project at the Utah State Agricultural College at Logan, Utah, where approximately 300 houses were being constructed by his employer, The M. & K. Co.

On Saturday, August 21, 1946, as such superintendent, Harries took a

10 wheeled truck of his employer from Logan to Salt Lake City where he loaded it with roofing materials belonging to his employer, for use in the Logan project and accompanied by his 14 year old son, proceeded to return with the truck and materials to Logan, to Sardine Canyon at the most direct route to his destination. While the son, at his father's request, was driving with his father on the seat beside him directing the operation, the truck was overturned and the father killed.

The son was not an employee of M. & K. Co.; he did not have, and on account of his age, could not obtain a driver's license, and was, therefore, forbidden by law to drive a vehicle on the highways of the state.

Under the amended section of the Workmen's Compensation Act, a recovery is allowed in every case where employee is killed by accident arising out of and in the course of his employment, "provided, the same is not purposely self-inflicted."

It is contended that this accident was not wilfully self-inflicted and that neither negligence nor wilful misconduct may defeat recovery unless they have the effect of taking the employee out of the course of his employment. Under the amended section, the word "or" has been substituted by the word "and" and it is, therefore, not necessary for the accident to arise both out of and in the course of employment. It is sufficient if the accident only arises in the course of employment.

The only question, therefore, is whether at the time of the accident, the decedent was acting within the course of his employment.

Harries as superintendent had a right to assign work to any employee that he saw fit and also had the right to delegate himself to do certain functions and in this instance, he determined to operate the truck in the performance of his employer's functions.

Company contends that when deceased turned the operation of the truck over to his son, who was not an employee of the company, and to whom the company did not think was competent, the deceased was not then in his employer's employment and, therefore, compensation could not be recovered.

Harries did not leave or abandon the work of his employer at the time of the accident. He remained right on the job in bringing the materials back to Logan. He was performing the very service that the company intended him to do, that of supervising the truck. The fact that the boy was not an employee of the employer's company and was driving the truck under his father's supervision was not sufficient to constitute a departure from his employment. He was in a place where his employment required him to be and at the time when he was required to do such work. He was doing such services as his employer required of him even though he turned the operation of the truck over to his son who was not an employee of the company. These facts did not necessarily constitute a departure from the course of his employment.

As to the question of whether or not the decedent wilfully allowed his son to drive constituted the sole cause of his death, the Court concluded that negligent or wilfull misconduct even though they did constitute principal cause of death of an employee, did not defeat reward. It is only when persons are killed by accidents self-inflicted, which is not the situation in this case.

It was concluded, therefore, that the dependents of the decedent were entitled to a recovery by reason of the fact that the decedent was performing the nature of the work that he was employed to do at the time of his death; that in so doing that job he was not violating the law; that in permitting his son to drive he did violate the law, but that went only to the manner in which he was performing his work and not in the job which he was doing and therefore, it did not constitute a departure from the course of his employment.

Award granted.

M. & K. Corp. et al, vs. Industrial Commission, et al, Supreme Ct. of Utah, Jan. 28, 1948

189 Pacific Reporter, Second Series, Page 132

Injured While Engaged In Tournament

EDWARD J. STEVENS, JR., a high school student, 15 years of age, was in his 4th year of service as a caddy for the Essex Fells Country Club, serving as such on Wednesdays, Sundays, Saturdays and holidays. His

weekly income including tips, was about $10.00.

It was contended that the golf club permitted the caddies to use its links for the playing of golf on Monday mornings, and gave war stamps "as prizes to the best scorers." While so engaged, Stevens, Jr., was struck on the head by a ball driven by another caddy-player. The play on these occasions was limited to the club's own caddies, about 300 in number. Participation in the weekly tournaments was not compulsory, the number taking part was usually about 100.

There was no compensation for the time thus spent, and there was no service credit or rating in any form for the experience so acquired. Nor was there any supervision of the play by the club management.

The complainant contended that play in the tournaments contributed

to his efficiency as a caddy. It improved his ability to measure distances and to keep track of the ball while in play and to advise players in the use of clubs, and as a consequence, his participation in the caddy tournaments was "mutually beneficial," and that by reason thereof, he was entitled to accident compensation.

An accident is not compensable unless there be an occurrence of an injury by accident arising "out of his employment" or "in the course of his employment." The words "out of" have reference to the origin and cause of the accident. The words "in the course of" to the time, place and circumstances under which the accident takes place. The former words are descriptive of the character or quality of the accident, the latter relate to the circumstances under which an accident of that character or quality occurs.

The character or quality of the accident as conveyed by the words "out of" involves the idea that the accident is in some sense due to the employment. It must be an accident resulting from a risk reasonably incident to the employment.

A risk is incidental to the employment when it belongs to or is connected with what a workman has to do in fulfilling his contract of service. There must be some casual connection between the accident and the employment, and it must be one to which the employee was exposed because of the nature of his employment.

In the instant case, the employee was doing something that was not related to his employment. The accident was not the result of a risk inherent in or incident to the employment. He was not then engaged in the fulfilment of his contract of service, but merely in the exercise of a privilege accorded by the employer to use the golf course for his own recreation and instruction in the principles and the practice of the game.

There was no foundation for the application of the principle of "mutual benefit." The benefit, if any, which inured to the employer was purely incidental and too remote to sustain an inference that such use of the club's facilities was in contemplation of an integral part of service. There was no casual relationship between the accident and the employment. Injury occurred solely during the time the employee was enjoying a favor extended. Participation in the tournaments was not within ambit of the employment.

Claim denied.

Stevens vs. Essex Fells Country Club—Supreme Ct. of New Jersey, March 1, 1948
57 Atlantic Reporter, Second Series, Page 469

Emergency Work Causes Heart Exertion

FARRAN suffered a heart attack as a result of carrying ice cream cans into a store in Millville, New Jersey in the course of his employment. The lifting and delivering of the cans were not part of his regular duties, but called for unusual exertion as the result of an emergency. Farran's normal duties involved soliciting orders, servicing claims and arranging advertising displays. On rare occasions, in an emergency, he was called upon to assist in carrying ice cream containers from his company's truck to the refrigerating units of the customer. On October 7th, 1946, such an emergency arose and Farran made several trips from the truck to the customer's store, carrying 3 ice cream containers each weighing 15 pounds. Shortly after making this delivery,

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he felt ill and had to be driven to his home by a fellow employee. Thereafter for a month, Farran attempted unsuccessfully to do light work for his employer.

On November 6, 1946, he again became ill and consulted a physician who diagnosed his condition as coronary thrombosis of the anterior vessel of the heart. Since that time he has been completely incapacitated.

The precise question for determination here is whether the heart attack found to have been precipitated by unusual and severe effort arising out of an emergency in the course of employment constitutes a "personal injury — by accident," within the meaning of the Workmen's Compensation Act.

An accident has been frequently defined as an occurrence which proceeds from an unknown cause and hence is unexpected and unforseen. The injury in the instant matter was the unexpected, sudden and unpredictable consequence of a known cause.

An award was made notwithstanding the fact that there was some evidence that the victim suffered heart disease before injury.

Philadelphia Dairy Products vs. Farran, Supreme Ct. of Delaware, New Jersey.

57 Atlantic Reporter, Second Series, Page 88, January 16, 1948

Eye Injury Due To Splash Of Caustic Soda

ON January 3, 1945, some liquid splashed into claimant's left eye in the course of his employment. His eye immediately became irritated and he reported to the shop nurse at once. She examined the eye and because of pain which had developed, recommended that claimant see an eye specialist. On the advise of the doctor whom claimant saw, he entered Wills Eye Hospital for treatment the following day. The eye was removed about two months later after futile attempts to save it.

Company resists the claim on the ground that the accident did not

arise out of employment, nor as the result of an accident. Claimant was employed as a cooper, and in the performance of his duties, he was hammering one particular barrel and some liquid splashed into his left eye. Claimant rubbed his eye and then he thought that he damaged it, in rubbing, by a splinter which he later found in his finger. The nurse who examined the eye with a glass immediately after the accident, found no evidence of a scratch on the surface of the eyeball.

Medical testimony indicates that the injury to the eye resulted in an inflammation which developed into acute uveitis and that such inflammation induces a sensation of physical damage to the eye which reasonably accounts for claimant's belief that he had scratched the eyeball.

The company contended that water uncontaminated obviously could not have caused the damage complained of. The barrel was wet when received by the claimant. The evidence indicates that the company would resort to soaking the barrels in a vat in which "green flakes" were dissolved, to "eat off the dirt inside and when the barrel comes out, it's soaked all over."

The green flakes were analyzed and determined that the chemical solution used was sodium hydroxide. Caustic soda caused the initial damage to claimant's eye.

The recovery was awarded not withstanding the fact that the claimant was not able to prove that it was caustic soda in the liquid that splashed in his eye.

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Gaffey vs. John J. Felin, et al, Superior Ct. of Pa., March 8, 1948
57 Atlantic Reporter, Second series, Page 432

Fight Results In Foreman's Death

NEWELL was employed as a boss shipper and it was his duty to supervise truck drivers, one of whom was Oscar Palmer, who had been at odds with his supervisor over the dilatory manner in which the latter claimed Palmer did his work. As a matter of fact, the two of them had had an altercation about two weeks prior to the time of the accident herein complained of.

Although Newell was shorter, smaller and older, this did not deter him from constantly criticizing the manner in which Palmer performed his work. Palmer, of course, resented his criticisms.

On the day of the fatal altercation, the boss shipper criticized Palmer for delay in delivering and locating material. A verbal argument ensued as a result of which Newell physically prodded Palmer down the stairs to hurry him along. Newell told Palmer "you are all done." Palmer suggested that they "come outside and settle it." Newell took off his coat, assumed a fighting pose, but did not strike a blow as Palmer first struck him either with his fist or with the heel of the hand. This caused Newell to fall and strike his head on a hard surface, resulting in a fractured skull from which he subsequently died before his version of the altercation could be taken.

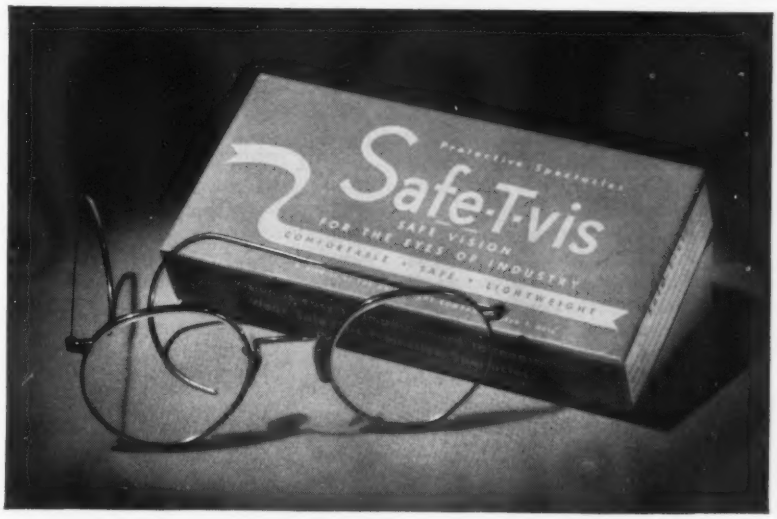
Company contended that the accident did not occur while in the course of his employment and, therefore, the heirs of Newell were not entitled to a recovery. It has been well established, according to the great weight of modern authority, that assaults are compensable if the assault arises out of a work matter and not out of a purely personal quarrel unrelated to the employment. It is clear that the ill feeling between Newell and Palmer occurred because of the work relations, while at work and as a result of the work done. While the assault may have resulted from anger or revenge, still it was rooted in and grew out of the employment.

Newell's actions were simply a misdemeanor, inasmuch as he did not strike Palmer. In determining whether the assault is serious or wilful within the meaning of the Compensation Act, it is the duty of the Court to consider the accident and not the misconduct.

Although the statute prevents recovery by reason of a serious and wilful violation of the law by employee, Newell's conduct amounted to a simple misdemeanor. The fact that Newell might be deemed to have been the "aggressor" does not in any way affect the decision in this case as there is no such thing as a defense of aggression, in the compensation statutes.

Injury resulting in death in the instant case by reason of the simple assault and battery by Newell who was a small foreman in hot blood upon a large recalcitrant subordinate was part and parcel of the rough and ready working environment of a truck driver and his boss, was not a "violation of the law" within the Workmen's Compensation Act.

Recovery was allowed as death resulted from an accident arising out of and in the course of employment. Newell vs. Moreau, Supreme Ct of New Hampshire, November 4th, 1947
55 Atlantic Reporter, Second Series, Page 476



A Spectacle in Safety!

New Plastic Lenses Combine Lightness and Comfort with Durability and Protection

Safe-T-vis, a product of The Univis Lens Company, is made from a brand new allyl casting resin and is a brand new kind of eye protection.

It's Light! Two Safe-T-vis lenses weigh approximately what one case hardened glass lens weighs. This lightness, and the resulting comfort of Safe-T-vis goggles, means that workers wear them for 8-hour protection on the job.

It's Durable! The use of allyl casting resin permits much greater surface hardness. Surface scratching and abrasion is now a negligible factor while length of service multiples.

It's Resistant! Closely supervised field tests show Safe-T-vis' superiority in chief causes of industrial eye injury. In impact tests, it withstood the drop of a 7/8" steel ball from 200 inches. *Your own tests* will be convincing evidence.

Write for booklet containing details on the lenses that permit utilization of all of the good features of plastic ... with none of the bad.

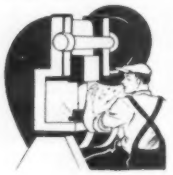
Safe-T-vis *8-hour Protection 8-hour Comfort*

Lightweight Protective Spectacles

A product of THE UNIVIS LENS COMPANY, Dept. O, Dayton 1, Ohio

Violation of "General Safety Requirements" Do Not Give Rise To Additional Awards

CLAIMANT filed a mandamus proceeding to compel the Commission to enter an additional award of compensation. The complainant contends that on the 18th day of June, 1942, while employed by a contributor to the state insurance fund, he was injured in the course of his employment by being struck in the face by a part of a cracked and defective die which part, by reason of the defective condition of the die, flew out of a press on which he was working. It is contended that the cracked and defective condition of the die was known to the employer but not to the claimant; that the injury sustained was due to the violation by the employer of a specific safety requirement in Sections 8 and 13 of bulletin No. 207 of the Industrial Commission and the Department of Industrial Relations and of a violation of Sections 871-15 and 871-16 of the General Code of the State of Ohio.



The Commission bulletin Sections referred to appear under the heading "General Safety Requirements" and read as follows:

Section 8: Employees shall report to their employer or his authorized agent, the existence of any unsafe equipment or any other hazard which may come to their knowledge and where such unsafe equipment or hazard is found to be a violation of this code, steps to correct the same shall be taken.

Section 13: Machine and presses shall be placed upon substantial foundations, floor or other supports and should when necessary, be firmly secured in place to prevent moving or shifting.

Section 871-15 and 871-16 provides in general terms that employers shall provide their EMPLOYEES with a safe place to work and shall do those things which may be reasonably necessary to protect the life, health, safety and welfare of such employees.

Question arises as to whether the references referred to constitute "specific safety requirements." The term "specific requirements" is understood to demand some particular act or thing to be done.

Section 35, Article II of the Constitution implies such lawful, specific and definite requirements or standards of conduct as are prescribed by statute or orders adopted by the Industrial Commission, and which are of a character plainly to appraise an employer of his legal obligations toward his employees.

The section of the code relied upon and the rules adopted by the Industrial Commission referred to are obviously not specific requirements within the constitution provisions authorizing additional compensation for injury resulting from employer's failure to comply with "specific requirement" of the constitutional above referred to or the statute adopted by the General Assembly and rules promulgated by the Commission for the safety of the employees.

The rules relied upon in this mandamus action are general in nature and rules of conduct and general duties flowing from employer-employee relationship, and are not the specific requirements warranting additional recovery.

Mandamus disallowed.

State ex rel Holdosh vs. Industrial Commission, Supreme Ct. of Ohio, March 10, 1948

Northeaster Reporter, Second Series, Page 165

Here's the Handy DAYTON "ROLL-ALONG" SAFETY LADDER

IDEAL FOR THE STOCK ROOM

. . . The Dayton Roll-Along Safety Ladder with its rubber tired swivel casters can be speedily moved in any direction with practically no effort.

Safety shoes with renewable treads hold ladder permanently and safely in place while ladder is occupied.

Constructed of tested airplane spruce throughout and reinforced with steel braces for additional safety. Folds compactly for convenient storing. Available in sizes 3-ft., 4½-ft. and 6-ft.

Elevating auxiliary platform which folds back in main platform adds height if desired. These ladders are being used in many of America's largest plants. See for yourself! Write today for bulletin.

For Safety's Sake . . . **consult our SAFETY DEPARTMENT . . . we have the complete line of safety equipment for your every requirement.**

DAYTON SAFETY LADDER CO.

2337 GILBERT AVE., CINCINNATI 6, OHIO

For complete information, just check any or all items listed, and send us the coupon.

MAIL NOW

DAYTON SAFETY LADDER CO.,
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GENTLEMEN:
WITHOUT OBLIGATION ON MY PART PLEASE SEND ME FOLLOWING CHECKED BULLETINS:

.....SAFETY LADDERS SHOES	.....SAFETY GASOLINE CANS	.....SALT TABLETS & DISPENSERS
.....SAFETY LADDERS	.....OILY WASTE CANS	.....SAFETY GOGGLES
.....SAFETY CLOTHES	.....EXCELSIOR CANS	.....GLOVES
.....ROLL-ALONG LADDERS	.....WATCHMEN'S CLOCKS	.....FIRE BUCKETS
.....FIRE HOSE	.....ACID PUMPS	.....ROCK UP RACKS
.....FIRE EXTINGUISHERS	.....RESPIRATORS AND PARTS	.....“PLY”
		.....EYE SHIELDS

(Name) .....

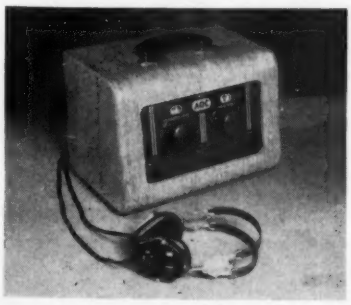
(Company) ..... (Address) .....

New PRODUCTS

NP-1 . . . SIGHT BOOSTER— Dazor Mfg. Corp. have recently put on the market the Dazor Floating Magnifier. Magnification and illumination are combined in the single unit

which, besides affording protection, gives closer measurement and greater precision in machining and cutting grinding. This modern sight booster is said by the manufacturer to reduce eyestrain and accompanying fatigue. This unit can be controlled by a touch of the hand. Wherever moved and at whatever angle placed, it stays without locking, held by the Dazor *Floating* arm.

NP-2 . . . PORTABLE AUDIOMETER—The Audio Development Co. recently announced their new ADC Model 53 portable audiometer, which is said by the manufacturer to offer superior hearing test equipment to



industrial plants at low cost. Attractively cased in a rugged, natural oak cabinet, the unit weighs approximately 16 lbs., including removable duck dust cover. All have the new frequencies approved by the Council on Physical Medicine of the American Medical Association. Though simple in design and in operation, the unit is said to function exactly as professional models falling into much higher cost brackets.

NP-3 . . . OUTDOOR SIGN—Wagner Sign Service Inc. have designed an outdoor sign as a medium of promoting health and safety and better industrial employee relations. The changeable letters on the sign make possible new messages each day. The

letters are 4 ft. high, are of slotted type and are attached to horizontal rods. Wagner letters are available in shock-resistant translucent colored plastic or aluminum. Colors are everlasting, go all the way through the letter, do not chip or scale and never require painting or other maintenance.

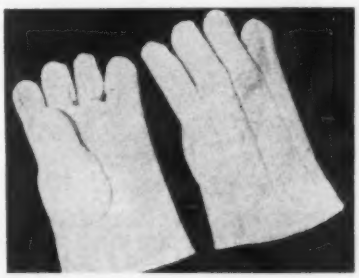
NP-4 . . . WATER COOLER— C. M. Cordley, President of Cordley & Hayes, New York, recently announced an addition to their line of Automatic Electric Water Coolers.

It is known as the HCS-10W and is unique in that it has a water-cooled condenser instead of the conventional air-cooled condenser. It is specifically designed for foundries, steel mills, textile factories, cotton mills, laundries and similar installations where there is unusual dust or lint conditions or where the temperature or humidity is extremely high.

It delivers 11.9 gallons per hour with 80°F inlet water cooled to 50° F. It is suitable for installations in hot locations with air temperatures up to 130°F. Normally, the HCS-10W uses less than 18 watts, and less than one gallon of water through condenser per gallon of drinking water cooled. Powered by 1/6 H.P. hermetically sealed compressor motor unit. Lubricated for life. Additionally, entire refrigeration system is factory sealed and covered by a 5 year warranty. External connection on the rear of the cabinet makes possible an additional remote fountain, thereby having one Cordley cooler serve two locations.

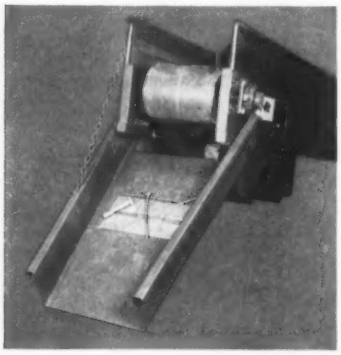
NP-5 . . . SPRAY BOOTH KIT— Safety directors who are responsible for reducing hazards around spray booths where inflammable paints and varnishes are used will welcome the Spray Booth Kit introduced by Ampco Metal, Inc. Kit consists of a well selected assortment of non-sparking tools suitable for cleaning or making repairs around the booth. These bronze tools do not emit sparks that might cause fires or explosions. Included in the kit are a claw hammer, long blade scraper, deck scraper, spray booth scraper, screw driver and chisel, all made of Ampco Metal or Ampco beryllium-copper. Tools are neatly packed in a wooden chest with hasp for fastening.

NP-6 . . . ASBESTOS GLOVES— Asbestos-Leather Glove Co., announces that after much research they have developed a lightweight asbestos glove popular with bulb and tube manufacturers and also for use in heat-treating departments.



This glove can be supplied in either men's or women's sizes, lined or unlined, all-over length 10 in. These gloves have proven satisfactory inasmuch as the user is able to feel the work by using a lightweight glove rather than the usual thick, heavyweight asbestos glove.

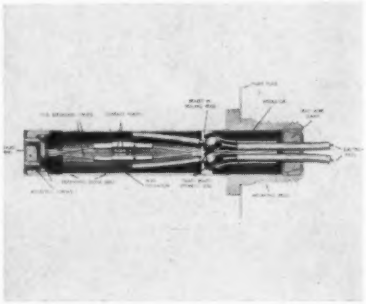
NP-7 . . . CONVEYOR AND PERMANENT MAGNET— Material Movement Industrial, Inc., announces that its lightweight Tote-All Bulk Material Conveyors are now available with an adjustable chute that removes all stray iron from the bulk material being conveyed. The chute,



which may be attached or detached as desired, has a powerful permanent magnet built right into it. It attracts nuts, bolts, nails, etc., which may be in the conveyed material and thus reduces the danger of fire and explosions from such tramp iron.

NP-8 . . . PROPORTIONER–Aladdin Proportioners meet the ever growing demand for a single, accurate mixing device which will automatically introduce either liquid foam or wetting agents into the fire stream, according to the manufacturer, Aladdin Engineering Equipment Co. This device is said to be a great step forward for the entire fire fighting field. The Model A.A proportions at the pump, giving fixed mixtures at 30 to 125 lb. with fog or straight stream. Model AA is designed for operations where pressure is maintained by a pump whether water supply is drafted or is from a booster tank—with all nozzles on all size lines up to and including 1½ in. The assembly is compact and light in weight and as far as known is the only automatic device without moving parts of its kind on the market.

NP-9 . . . FIRE DETECTOR–A new fire detecting device which combines high sensitivity, "high fidelity" response to the temperature setting, automatic repeatability plus ruggedness and long life has been recently placed on the market by Fenwal, Inc. Designed for universal application over a broad temperature range, the new Detect-A-Fire unit is suitable for both ordinary and explosion-proof applications. These units can be spaced at 25 ft. intervals—considerably greater spacing than other fixed-temperature type detectors. The unit is hermetically sealed against dirt, dust, vapor penetration, oil and other contaminants.



Control OIL DERMATITIS

THESE TWO STEPS WILL CHECK IT IN YOUR PLANT

THE germ of Oil Dermatitis is transmitted by lubricants entering abrasions of the skin. Guard your men from Oil Dermatitis these two ways:

ONE . . . Add Derma-San "I" to all cutting compounds to kill pus-forming germs. It has a phenol coefficient of fifteen, but can be used freely in the dilution recommended. It never causes rusting or clogging. (If straight oils are used, Derma-San "S" is recommended.)

TWO . . . Use Derma-Sol Liquid Soap for added protection against Dermatitis. It is an efficient, high quality, industrial soap containing emollient oils which soothe irritated hands and prevent dryness or cracking of the skin. Write today.

HUNTINGTON LABORATORIES INC. HUNTINGTON, INDIANA • TORONTO, CANADA

DERMA-SAN "I" DISINFECTANT ★ REG. U. S. PAT. OFF.

DERMA-SAN "S" DISINFECTANT ★ REG. U. S. PAT. OFF.

DERMA-SOL INDUSTRIAL LIQUID SOAP

NP-10 . . . RAIN SUITS—Industrial Products Co. announces two styles of improved wet weather garments, patterned in both one piece and two piece styles to offer protection in rain, snow and sleet. Said by manufacturer to be absolutely waterproof and windproof and patterned roomy to be worn over regular clothing. These rain suits are manufactured of a double textured fabric with a sheet of solid rubber vulcanized in between. They are recommended for electric and telephone linemen, maintenance men, contractors emergency crews, tank farm, patrolmen,

dye plants, yard workers, railroad men, watchmen and all men who must work on the outside regardless of the weather.

NP-11 . . . SALT TABLETS— U. S. Safety Service Co. are producing PEP-UP Tablets which have an exclusive patented coating designed so that the contents will not be absorbed by the stomach but will be dissolved in the small intestine. The manufacturer has pointed out that clinical findings reveal that most salts are only absorbed in the system through the walls of the small or upper intestine and are not absorbed or digested in the stomach. These tablets with their special coating can now be taken by workers without ill effects, yet quickly relieve fatigue due to excessive perspiration.

For prompt information on these new product items use the return post card bound into this issue. Drop it in the mail today!

NP-12 . . . RETRACTILE POWER CORDS—Koiled Kords, the retractile, spring line power cord made by Koiled Kords, Inc., are finding innumerable uses in industrial plants, according to the manufacturer. On hand power tools of any type as well as on any large electrical equipment that moves Koiled Kords do away with wires that trail and cut down accident hazards. The retractile action provides longer life because of the elimination of tangling and kinking. Cords are neoprene jacketed, providing protection against the deleterious effects of grease, acids and other usually troublesome materials. Koiled Kords are made in 4 ft. retracted lengths that extend to approximately 25 ft.

NP-13 . . . MAGNESIUM BARREL SKIDS—New lightweight all-magnesium skids weighing as little as 25 lbs. in the 7 ft. length—yet with a capacity of 1,000 lbs.—are offered by the Magnesium Company of America. The extremely light weight of Magcoa Skids makes them easy to handle, fast to position, and much safer to work with. Sturdy, all-welded construction makes them most economical due to long lasting efficiency at heavy duty applications.

No need to sacrifice one important advantage to obtain the other. When you order your floors finished with VESTA-GLOSS you obtain *both . . . and more.*

The ONE Floor Wax that provides ALL SIX of these floor maintenance essentials—(1) Slip Resistance (2) Wear Resistance (3) Water Resistance (4) Lustre (5) Self Leveling (6) Non-Tacky.

Approved by Underwriters' Laboratories

VESTA-GLOSS

Safety engineers recommend VESTA-GLOSS as the most practical and economical finish for all types of floors for factories, institutions, warehouses, etc.—wherever foot traffic is heavy and where safety demands slip-resistant floors.

VESTA-GLOSS provides that attractive polished appearance with the additional advantage of slip-resistant safety and serviceability. Easily applied—self-leveling. Non-tacky. Tough too—will not flake, crack or powder off. And so easy to *keep* beautiful—simply sweep with a soft brush or Vestal Buffing mop. Write us for free demonstration.

BRITEN-ALL
A highly concentrated liquid cleaning compound for floors and woodwork. Briten-All is a neutral floor cleaner that cleans better, safer, easier—at lower cost.

VESTAL ELECTRIC FLOOR MACHINE
Scrubs and polishes faster. Easy to operate. Safe. Exceptionally quiet. Sturdy, perfectly balanced construction.

VESTAL INC. ST. LOUIS • NEW YORK

INDUSTRY News

NEW DISTRIBUTOR FOR CESCO . . . Chicago Eye Shield Co. has announced the appointment of Guardian Safety Equipment Co. of Philadelphia as their distributor for the states of Delaware and Maryland, Eastern Philadelphia and Lower New Jersey. The Guardian Company is headed by Fred R. LaForce. Mr. LaForce has devoted many years to the safety field as a sales and safety engineer for Chicago Eye Shield Company prior to his new appointment. In addition to Cesco products, Guardian will handle a complete line of safety equipment.

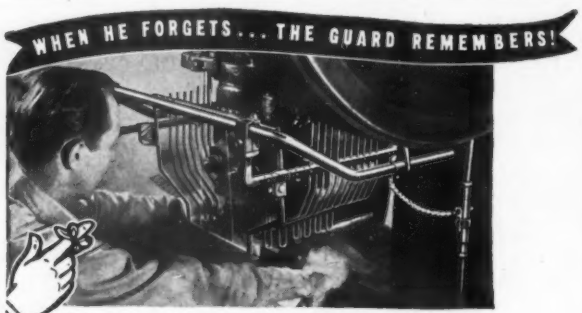
NEW SALES MANAGER . . . Federal Electric Co., Inc., manufacturers of electrical signalling devices and lighting fixtures have announced the appointment of William W. Scott as General Sales Manager. Mr. Scott has been associated with Federal Electric Co., Inc. for more than 20 years.

GRO-CORD PROMOTION . . . The election of B. H. MacLeod, General Sales Manager of Gro-Cord Rubber Company as Vice President of the company by the Board of Directors has been announced by Kyle Menuez, General Manager of the company. Gro-Cord manufactures soles and heels for both the shoe manufacturing industry and the repair trade. Their soles and heels are used in many types of safety shoes.

U. S. REPRESENTATIVE . . . E. G. Quesnel, Director of Safety for the Borden Co., was appointed to represent U. S. management on the International Labor Organization's committee on Accident Prevention. He was named on the recommendation of the U. S. Department of Labor.

The 12-nation committee plans to meet in Geneva, Switzerland, in October to work out a program on the prevention of industrial accidents.

Mr. Quesnel, a leader in safety work for more than 25 years, will



Here's protection against those forgetful moments when tragedy lashes out to claim its toll.
The Junkin Safety Guard is effective . . . dependable. It can't "forget" because it's built in . . . actually becomes a part of the press itself.
That's how Junkin is helping thousands of satisfied users set up better safety records . . . higher production records.

If you would like the facts about Junkin Safety Guards, write us. There's no obligation.

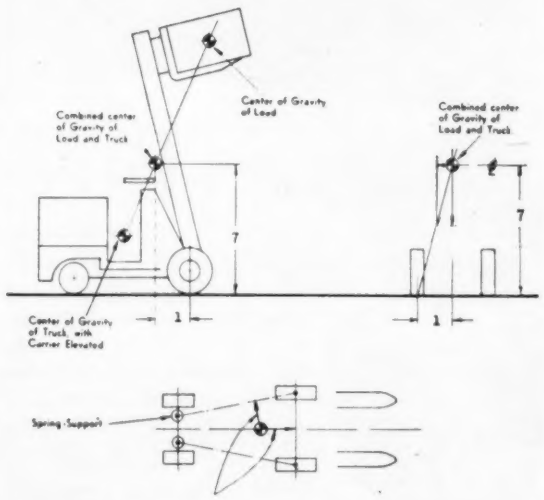
Write For This New Bulletin

JUNKIN SAFETY APPLIANCE CO., INC.
930 W. HILL ST., LOUISVILLE, KY.

JUNKIN SAFETY GUARD

STABILITY FACTOR—HIGH LIFT TRUCK

The stability ratio of high lift trucks should not exceed 7 to 1 ratio of the combined center of gravity to half the effective



wheel tread, or the distance to the center of the wheel axle, as shown on the sketch on this page. Minimum distance from combined center of gravity of truck and load to effective wheel tread, or to center of drive axle. *(Yale & Towne Mfg. Co.)*

help summarize for the committee the latest accident-prevention techniques.

SAFETY RECORDS . . . Unusual safety records set by The Heyden Chemical Corp. plant at Fords, N. J., have received special recognition in the last month. As of the end of March, 1948, employees have worked 316 days without a lost-time accident. Since this perfect record began June 16, 1947 and was continuing in March of this year, it resulted in the plant receiving a Merit Award in the 20th Statewide Interplant Safety Contest sponsored by the New Jersey Department of Labor and the New Jersey Industrial Safety Committee. The plant was also awarded a Testimonial Certificate by the American Mutual Liability Insurance Co. The insurance company pointed out that the excellent record achieved by Heyden was due to active participation of management, supervisors and workers in their Safety Program.

M.S.A. EXECUTIVE VICE PRESIDENT . . . John T. Ryan, Jr., has been elected Executive Vice President of Mine Safety Appliances Company, according to George H. Dieke, President.

Mr. Ryan joined the company in 1936 following graduation from Pennsylvania State College and

J. T. RYAN, JR.

Harvard Graduate School of Business Administration. Prior to his present position he has been successively Sales Engineer, Assistant General Manager and General Manager.

(Please turn to page 42)

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Lightweight, Sturdy Protection

● DOCKSON cover-spectacle goggles are hard to beat. Designed for maximum comfort and ample ventilation, they are light weight, non-fogging and sturdy.

Replaceable lenses to your specifications, permit wide vision range. Rigid brace bar allows easy adjustment and convenient raising and lowering with one hand.

These goggles offer maximum protection and comfort.

Available for chipping, grinding or welding use.

(Write for our Welding & Safety Equipment Catalogs)

DOCKSON CORPORATION 3839 WABASH • DETROIT 8, MICH.

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Systematized Sanitation

ONE POLICY FOR *31 Years*

You can buy hundreds of sanitation products, but in Systematized Sanitation, you buy guaranteed results. This practical, economical plan of service superseding the sale of products has been imitated because of its wide-spread success . . . but *never* duplicated. During the past 31 years, hundreds of leading concerns have effected important savings in their plant-keeping program with Systematized Sanitation. Write today for complete information about this simple, individualized program.

Systematized Sanitation enables your present labor to do more tasks—better!

SYSTEMATIZED SANITATION

The GERSON-STEWART Corp.

LISBON ROAD · CLEVELAND, OHIO

Useful Literature

UL-25 . . . SAFETY CONNECTING LINKS—Interstate Drop Forge Co., have prepared a folder illustrating and describing their new WEDG-LOK Safety Connecting Links, an improved connecting link that combines safety with unique simplicity in assembly. For use in wire and chain slings, drag lines, etc. The pamphlet includes complete specifications and list prices on the various types of links.

UL-26 . . . POWER DRIVEN STAGINGS—Spider Staging, Inc. have prepared a colorful pamphlet describing their Spider Staging, so named because it simulates the action of a spider suspending itself on a single line. The staging, hanging on a single dead cable, is capable of ascending and descending a drop of 350 ft. Manufacturer claims that with this equipment the user needs no ropes, blocks, planks or connecting planks. It is safe and easy to operate. Safety features include a completely enclosed automatic emergency brake and an armature brake which gives the operator perfect control of the staging at all times.

UL-27 . . . ANTI-GLARE COATING—The Skybryte Co. has just released a full color illustrated folder on their product, SKYCO NO-GLARE, which is a light blue translucent material that is brushed or sprayed on windows or skylights, admitting 94% light. According to the manufacturer, harsh glare is turned to soft diffusion, eliminating eyestrain by shutting out glare. Typical application of this product is over factory-type windows.

UL-28 . . . SAFETY CAPS, APRONS AND ARM GUARDS— KLEAR - VU Products Co., Inc. have available a folder describing their safety caps, aprons and arm guards. The safety caps are described as being completely flameproof. Top and rigid visor are of close-woven fabric; mesh back bound in live elastic. Aprons and guards are made of easy to clean transparent vinyl film, strongly bound and carefully tailored.

UL-29 . . . QUART SIZE FIRE EXTINGUISHER—Phister Mfg. Co. have prepared a four-page folder describing their one quart size, mounted, air pressure fire extinguisher. Built entirely of high grade brass and copper, this unit is said to assure action when needed. It is corrosion-resistant and simple of operation. The Phister No. ¼ is new in size only. It is fundamentally the same two-chamber extinguisher which is so well known in the larger sizes.

UL-30 . . . SAFETY BOOKLET—A limited supply of free copies of the booklet "Butch Learned the Hard Way" may be obtained from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C. This pamphlet is the first of a series to appear in the coming months heralding the President's National Conference on Industrial Safety. It is a safety guide for workers in all types of industrial plants and discusses such basic essentials as wearing protective clothing, using machine guards, good housekeeping, eliminating horseplay, etc.

HI-LIFT

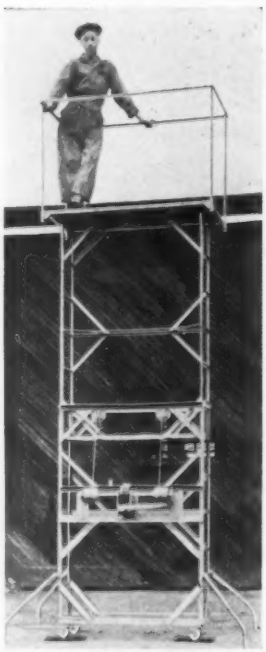
MARQUEE SERVICER

Outrigger brace prevents tilting or rolling.

Only 6 ft. 8 in high with a base 29 in. x 4 ft. Can be raised to a height of 11 ft. 6 in. Sturdily constructed of all welded steel, it can be easily rolled and will pass through a door 30 in. x 7 ft. Stock platform size 27 in. x 54 in. Special sizes made to order. Platform easily raised by hand-operated winch with self-locking worm gear, held by two steel cables.

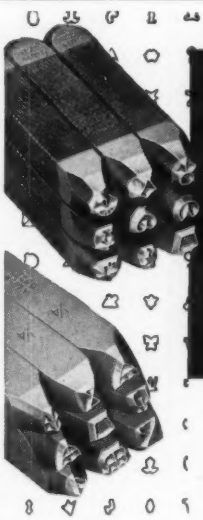
Write for full information

Also makers of HI-LIFT Extension Scaffold and ATLAS One-Man Truck Loader.



ATLAS INDUSTRIAL CORP.

852 39TH STREET BROOKLYN 32, N. Y.



USE "SAFETY" CODE SYMBOL STAMPS FOR

- PIECE WORK IDENTIFICATION
- INSPECTOR'S APPROVAL
- DATE CODING
- CONTAINER CONTENTS
- SPECIFICATIONS
- UNLIMITED CODE USES

"Safety" Code Symbol Stamps for every code identification purpose are furnished in stock or special designs—in "Safety" Heavy Bevel or Wedge-Grip styles as shown above. Write for literature or proposal on your needs.

M.E. CUNNINGHAM CO.

SAFETY STEEL STAMPS

91 East Carson Street • Pittsburgh 19, Pa.

TECHNICAL FILE ON TOXIC GASES AND VAPORS

SAVE THIS VALUABLE REFERENCE MATERIAL: BUILD UP A PERMANENT OFFICE FILE.

D 1. DEFINITION OF GAS. A gas is a fluid in air state, without definite shape of volume. It expands indefinitely unless limited by a container, and does not change to a liquid form merely by increasing pressure upon it. A gas fills space much as liquid does, except that it usually is not visible. To understand properly the danger from toxic gases we must realize that the air we breathe is a mixture of gases. Those gases heavier than air spread over an area, just as water does. Their level is upset easily by air currents which make their upper margin difficult to define clearly. Those gases lighter than air level off at the top of a room or container in a manner similar to oil on water. When agitated by an air current, or other physical movement, the lower level of such a gas diffuses somewhat with the air below it, but regains a margin when still. The gases at the worker's breathing level determine the extent of his exposure to danger. Certain gases tend to replace air in the space they fill, or combine with the air mixture to cause a deficiency of oxygen available. In such cases, whether or not the gas is toxic or irritating, all persons present in the space will suffocate. Examples are nitrogen and hydrogen.

D 2. VAPOR. In a general way, there is little difference betwen a gas and a vapor except that the vapor becomes liquid by application of pressure increase alone. Volatile liquids have vapors hovering above them, but if the vapors are permitted to expand into the air indefinitely, they become gases or gas-mixtures. Gasoline is a typical example of this.

D 3. DEFINITIONS OF FUMES AND MISTS. If there should be a condensation of solid particles within the vapor state, the result comes under the classification of fumes. An example is fusing encountered in the heating of metals, such as lead and zinc. When the fumes are composed of solid particles below one fiftieth of a thousandth of an inch (0.5 micron), they come under the classification of smoke. Usual examples are seen in the burning of organic materials, such as oil, coal, wood and paper.

Mists, sometime referred to as fogs, occur when liquid droplets are condensed upon floating solid particles in a vapor. Other instances of mists occur on the surface of acids when such liquids tend to atomize or break down into components.

D 4. HAZARDS OF EXPOSURE. Any substance is harmful if excess amounts find their way into the body. A gas, solvent of fume may quickly cause a fatality, or produce permanent damage to the system or its organs, or have only a temporary, transient effect upon the body. Gases or solvent vapors are rarely stored in the body. Blood saturated with either during the usual eight hours at work will clear itself normally in an interchange with oxygen in clean air during the remainder of the twenty-four hours. Transient exposures usually result in short, temporary disability. Constant daily exposure to air contaminated over safe concentration limits usually results in serious illness. Any working atmosphere that has a noticeable odor or that irritates the eyes, nose, throat or lungs can be suspected as unsafe to work in continuously. Aany hazards to the worker are increased by individual personal factors, such as overweight, alcoholism, gland disturbances, allergies and personal, home or factory hygiene.

D 5. EVALUATING SUSPECTED GAS HAZARD. The main factors in evaluating a suspected gas hazard are essentially the *concentration* of the gas and its *toxic power*. The former depends upon the quantity of gas present; the latter depends upon its physical properties—weight, solubility in water, flammability, etc.

D 6. FACTS ABOUT BREATHING. The normal person at rest breathes between 10 and 20 times a minute. The action of breathing is an involuntary, muscular movement. Life depends upon its automatic, adequate continuation. When we inhale, either through the nose or mouth, the normal passage of air is unhindered except during the swallowing of solids and liquids. In the throat there are two tubes, one called the esophagus, leading into the stomach, and the other called the larynx (voice box), leading into the windpipe. The windpipe divides into two branches that we know as the bronchi, which again divide into many smaller passages, called bronchioles. These end in the terminal air sacs, or air cells within the lungs, which thus makes the lung resemble a sizable sponge. Until the inhaled air reaches these terminal air cells nothing has happened to it other than its distribution over wide area within the lungs (almost 1000 square feet). The air cells, or compartments, have capillary blood vessels with walls so thin and fine that air or gas can pass through them into the blood itself, although the blood, having a greater density, normally cannot leak back. However, the blood can return through the walls the used gases, chiefly carbon dioxide. This is a waste product of the use or combustion of muscle and the lungs promptly exhale it. The contractions and expansions of the large muscles of the diaphragm and ribs are responsible for the physical act of breathing, the lungs passively responding to such actions.

TECHNICAL FILE ON TOXIC GASES AND VAPORS

D 7. METABOLISM. A person can hold his breath for from thirty seconds to one minute. Anyone engaged in heavy muscular activity cannot hold his breath anywhere near this time. The inability continues for a period even after the exertion stops and is due directly to a body process known as metabolism. Metabolism is nothing more than the combustion or destruction of muscle. This process provides fuel for the automatic and semi-automatic functions of the body. It also preserves the body temperature. The gas, carbon dioxide, is the main by-product of the oxygen-consuming combustion and is discharged into the blood circulatory system at the various muscle-activity points. In releasing energy required for work or exercise, the inner fuel consumption obviously increases the discharge of the carbon dioxide into the blood stream, which as usual carries it back to the lungs. However, a portion of the returning gas always comes in contact with certain nerves at the base of the brain which control the impulse to breathe. The more carbon dioxide the blood absorbs, in general, the more acid it becomes in content. This acidity affects the breathing nerves, which are very sensitive and react to even slight changes. Thus, they create a drive to breathe and, by reason of the stimulus, remove the carbon dioxide accumulating in the lungs. Holding the breath during violent exercise, even briefly, therefore becomes unbearable. Conversely, of course, the amount of carbon dioxide in the blood is proportional to the body's need for a greater supply of oxygen. It can be said in a general way, then, that a sudden deficiency of oxygen, when inside or outside the body, results in a more rapid, deeper respiration. For each individual the amount of air breathed during various degrees of body exertion is always a specific quantity, constant to him, and represents his rate of metabolism. The volume requirements of pure air vary from 6 liters per minute to 150, depending upon the kind of activity performed by the body. General estimates place the total volume of uncontaminated air needed by one worker per eight-hour period at 10 cubic meters. It follows, of course, that the amount of work performed has a direct bearing upon the amount of toxic material inhaled in an unsafe atmosphere.

D 8. BLOOD-CIRCULATORY SYSTEM. An average, normal person has about 5½ quarts of blood. Every minute that amount of blood can be cleared easily through the capillary blood vessels in the lungs, by reason of the pumping action of the heart. From 2 to 3 quarts of carbon dioxide gas and about 1 quart of oxygen can be handled or absorbed by the blood at the same time. Usually, the gasses are transported in the form of compounds, after having been converted chemically by the constituents of the blood. The constituents are mainly the red and white corpuscles or cells, carried in an almost colorless liquid, called the plasma. The coloring matter of the circular red cells is a substance called hemoglobin, which can unite with oxygen to form a definite oxygen-carrying compound known as oxy-hemoglobin. The white cells have no duty in the respiratory operation and their number in the normal blood is only one for every six hundred of the red sacs. The plasma, however, acts as the medium for transporting the carbon dioxide gas, usually in the form of an alkaline compound, like sodium bicarbonate. Oxygen is picked up from the air in the lungs in proportion to the saturation of oxygen and carbon dioxide in the blood, and because of its higher tension, oxygen tends to replace the gases coming back from the tissue-combustion or metabolism processes mentioned above.

D 9. CLASSIFICATION OF GASES. The following classifications are overlapping in some cases where certain concentrations of the same substance exert more than one effect. The list mainly is taken from Henderson and Haggard's book, "Noxious Gases."

Group I—Asphyxiants. Some gaseous substances can cause simple suffocation by excluding oxygen from the lungs mainly by their inert presence. Examples are nitrogen, hydrogen, helium, carbon dioxide, methane. They achieve the same result upon a person as would be experienced in the low-pressure, rarefied air of high altitudes. Other asphyxiants cause suffocation by reason of a chemical reaction, usually upon the blood or tissues. They combine to form a compound which either prevents the blood from carrying oxygen, or which prevents tissues from making use of oxygen.

Group II—Irritants. Gases of this class injure by inflaming the air passages, the lungs or both. Examples are ammonia, chlorine and the nitrogen oxides.

Group III—Inorganic and Organo-metallic gaseous substances. Many volatile poisonous elements, like the cell poisons, mercury and phosphorus, and toxic compounds, like nickel carbonyl and tetraethyl lead, are included in this group. Most of them are dealt with under metal poisons (see past issues of OCCUPATIONAL HAZARDS—'TECHNICAL FILE ON METAL POISONING'). However, to these can be added hydrogen sulphide, phosphine and the more complex arsenic-base gases. This third group is composed in general of substances capable of being destructive to any living matter.

Group IV—Anesthetics: solvents, volatile drugs and drug-like substances. These gaseous substances exert only minor influences on the respiratory tract or lungs, but may act dangerously after being absorbed by the blood and circulated throughout the body. A great number of volatile hydrocarbons, like gasolene and naphtha, are included in the above group, but their action usually is without after effects. They curtail the activity of the central nervous system in the same way as ether in surgery. Other of the volatile substances, as the alcohols and organic nitro compounds, do permanent damage to tissues or organs of the body.

(To be continued)

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Do you have any questions, theories or ideas concerning industrial health or safety? If you want to give them a good airing—send 'em along. We'll publish all space permits.

New Association

OCCUPATIONAL HAZARDS:

When a tragedy strikes in an industrial plant or a community a well trained and equipped rescue and first aid squad is needed. We have many excellent ones in the United States and Canada but we are also in need of many more and better trained ones.

For this reason an International Association of Rescue and First Aid Squads is being organized and Mr. William H. Stephenson and I are aiding in getting these leaders in the field together and in making their plans for the first meeting.

Because industrial rescue and first aid squads play such an important part in saving lives, we are anxious for them to know of the meeting of the International Association of Rescue and First Aid Squads in Atlantic City, September 19th and 20th. We hope you will find it convenient to publish notice of this in OCCUPATIONAL HAZARDS.

Thanking you in advance for bringing this newly formed organization to the attention of safety directors and rescue squads in industry,

Sincerely,
Esther Myers Stephenson, R.N.
(Mrs. William H. Stephenson)

Where's April Fire Section?

OCCUPATIONAL HAZARDS:

We usually like your magazine but, if you'll pardon the expression, your April 1948 issue "stinks." What happened to the Fire Section??? Yours for keeping that part of the book intact.—James L. Holland, Madison, Wisconsin.

Our apologies to reader Holland and the many others who wrote us inquiring about the omission of the April Fire Section. Our April issue is our Annual Goodhousekeeping Issue, and because of a paper shortage we were unable to include the fire section. Next year we hope to do so however, and will have fire prevention stories slanted to the goodhousekeeping angle.—Ed.

Fire Section

OCCUPATIONAL HAZARDS:

Would you please send me a complete set of tear sheets on all of the "Fire Protection Section for Industry" as they have appeared in your fine safety magazine since the first of the year? For your information I am keeping a complete file of all the valuable articles on plant fire prevention which you include in this section but my supervisor won't permit me to tear up his copies of OCCUPATIONAL HAZARDS.

In closing I'd like to say that my only "beef" concerning your magazine has to do with intervals between publication. Why can't you put it out twice monthly?—George Fleming, Troy, N. Y.

Carries Away Overspray . . .
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PAINT-LADEN AIR IS "TORNADO" CLEANED. Operators, working in a Schmieg Centri-Merge Spray Booth, are adequately protected from fire and fumes. Overspray is carried on an air stream *horizontally* away from work into a curtain of water, pressure-fed through slots extending continuously full width of booth, that descends down the flood sheet. The mixture of fume and paint-laden air and water is then whirled under the flood sheet and hurled with tremendous impact against the impingement wall at back of booth. Down this impingement wall flows an additional sheet of water that floods the foreign matter, pounded out in the process, into the sludge tank below. Only CLEAN AIR passes through exhaust fan. Thus the danger of fire is suppressed both in front and behind the flood sheet. Because the ratio of water and air is far greater in Centri-Merge, paint and other gummy substances do not pile up on the hard-to-get-at walls of the chamber behind the flood sheet; therefore, cost of repeated cleanings is eliminated.

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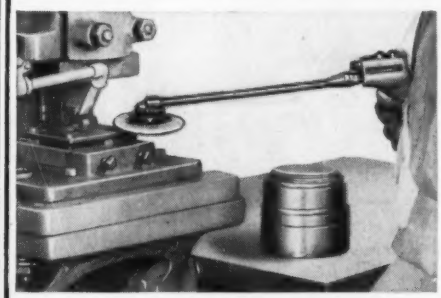

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CORRECTING VISUAL DEFICIENCY IN INDUSTRY
from page 13

ager of a department. We explain to him what we are going to do and what we hope to accomplish; that our primary motive is to help him do an efficient and safe job of running his department and to help the men to work comfortably and safely. Above all, after we have built up his belief that something big and effectual is going to take place, we don't let him down with a weak follow-through. We tell him to call me, on the day of the week I am in the plant, about any visual problem that has come to light—such as strain on a certain operation, complaints of glare or general lighting. Complaints of too much or too little lighting are given special attention.

Obtaining Cooperation

We assure him that all his workers will be notified concerning their skills within one week after the tests are made. We answer his questions and we are sure we have his enthusiastic cooperation before we start. Then the manager shows me the various operations in his department. I note the critical working distances and what the workers do with their heads, eyes and hands. Any workers with known uncorrectible visual problems are pointed out to me.

We do not believe in a blaze of screening activity for a short time followed by a long period of inactivity. A technician tests one-twelfth of the plant each month so that the program is continuous.

Findings are turned over to me. I divide the men, according to their skills, into three groups. Group one are those with clear and efficient vision. Group two are borderline cases, with minor symptoms about which we feel warning is justified. Number three are the referral cases. These are individuals whose visual difficulties have reached the point where we feel they should seek outside professional advice immediately. Referral cases are called into conference with their manager, Mr. Burris, and me. I explain their condition and we all try to encourage them to seek eye care from a vision specialist of their own choice. This gives the manager the opportunity of knowing the men who are working with visual handicaps. Whether or not they accept our advice is purely voluntary, but a large majority do so. These conferences also give Mr. Burris an opportunity to solve many safety glass problems. Any worker who mentions to the technicians, when his skills are being checked, that he is having trouble with his safety glasses is automatically called into these conferences.

Referral cases are given letters and referral cards to take to their eye men. The letters explain the company's visual program. The referral cards contain information concerning each man's operation which I obtained when visiting the various departments. This will help the vision specialist in formulating a correction. It is particularly helpful in bifocal cases where ranges of vision are limited.

After the referrals have been handled, the manager is given the notice cards for the good and borderline cases, which he passes out to his men. Because many of these borderline cases prefer to take care of the situation immediately before it gets worse, we also give that group letters and referral cards.

We then give the manager a tabulated sheet listing his workers and the particular visual group into which they fall. We ask him to use this information in transferring men to more suitable operations. If he has a worker with a visual problem that cannot be helped, obviously, he will want to take that into consideration. In addition to the 300 physically handicapped workers previously mentioned, we also have hundreds who are blind or practically blind in one eye.

We also ask the managers to keep records of the borderline and referral cases who obtain a complete visual analysis. We, of course, keep records of those who act upon our advice.

This program is proving worth while. The managers like it and the men like it. But far more important, it is helping to lessen the frequency of serious accidents.

SMASHING T. B. WITH MASS X-RAYS
from page 15

the identity card his findings. This marking merely indicates that the films shows a negative chest, or one which has some indicated pathology. No attempt is made to diagnose the actual pathology on the basis of these small screening films; this is done after the subject returns for a larger 14x17 X-ray.

In the building furnished by the tuberculosis division of the District health department, all the 70mm screening films are developed, and here, too, the 14x17 films are taken and developed. In the same building are kept all the records, and the clinic held for suspected cases.

Human Relations

An example of the way the clinic is operated was seen by the writer when he accompanied Mr. Billows on a tour of inspection yesterday. It was the clinic where all the questionable cases who had been screened and found with some indication of chest trouble came in—150 to 250 per day—for their large 14x17 check X-ray. There I was shown records indicating that to date 12,070 had come in for such a recheck. Among them, while I was there, appeared an old man of 75. He had never been to a doctor, knew that he occasionally felt weak but thought this and his frequent tiredness and coughing spells were merely old age. He had no money for a doctor, felt he had never needed one. But when he received the letter asking him to report back for a recheck he was scared.

We reassured him that while there was some evidence of disease in his lungs, he was quite safe at his age, provided he would be careful. Regular rest and a building diet would probably solve his problem. He was profusely thankful, saying "I'm going home to pray and cry, I am so happy. I will always pray for you and thank you for your kind work." Such incidents, Mr. Billows says, are daily occurences at the clinic, where the workers see human sadness and joyousness unfold about them.

Screening Results

Approximately four in each hundred films taken during screening indicate a need for further checking, and all such suspects receive a carefully worded letter asking them to return. These letters go out in about ten days after the first X-ray is taken. Perhaps one out of each four recalled had some stage of tuberculosis. One of the other four will have some other chest pathology such as cyst or tumor. Because this case, too, is sent to a particular clinic, the drive is proving of even greater benefit than would otherwise be true.

At the clinic, the doctor shows the patient his 14x17 diagnostic film and answers any questions so that he will be more likely to go to the right clinic or his private doctor and get well of his trouble.

Six-tenths of one percent screened so far are found to have enlarged

(Please turn to page 40)

. . . And Sudden Injury

A member of a maintenance crew is shown here after being killed when a building which was being wrecked collapsed prematurely. This man's life could have been saved if safety rules had been obeyed. *(International News)*

ON the opposite page is a picture showing the result of someone's carelessness during a wrecking job. As is often the case, plant maintenance crews are called to do wrecking work to make room for new plant additions, etc. Whenever such a job is planned, the safety engineer should remind everyone concerned that each job has its own special hazard or hazards. While no formula can be drawn up to prevent injuries during such work, there are certain precautions to take—most of them being determined by the application of a little horse-sense.

If a building is extremely old, for instance, care should be taken at all times to keep members of the crew in the clear in event of premature building collapse. All the men should know what other members of the crew are doing and so avoid being trapped by operations other than the one on which they are working.

Standard safety equipment to wear on all jobs include hard hats, gloves, safety shoes, safety goggles and life line equipment. Standard safety practices should be observed if tanks are being removed from the building. Care should be taken to clean out any pipes or tanks which have contained gasoline or other explosive mixture before cutting operations are started.

A common type of injury occurring during wrecking operations is the puncture wound caused by rusty nails protruding from scrap lumber, etc. Such nails should be flattened and care taken that boards are not strewn about the grounds with nails remaining in dangerous upright position. Safety shoes always afford good protection from falling objects and will also afford protection from puncture wounds caused by nails if the soles are in good condition.

Cooperation and teamwork are important if a crew expects to do the job without mishap. Material, for instance, should be lowered to the ground by rope—not thrown. Common sense will dictate to the safety engineer the safety procedure required during such operations.

Byron-Jackson Factory, Los Angeles, Calif. Archt.—Ellis Wing Taylor, Los Angeles. Contr.—C. L. Peck, Los Angeles.

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COST OF INFECTIONS—$39.04 From page 16

injuries. Medical supplies were used in all cases; the number of treatments using medical supplies ranging from one to 30 and averaging 6.8. An x-ray was taken in only one of the 20 infection cases while transportation was provided in 2 cases. Forty-five per cent received hospital care. None of the injured employees were paid permanent disability payments though 25% received compensation.

It was found that the average cost of time lost was $3.16, the cost of overhead being $6.90. (In connection with all of these cost items, the reader is referred to the March issue in which is explained the various sources used by Mr. Windsor in arriving at these important figures. Final report and settlement receipts of the insurance department, for instance, is one of the many sources used by Paul Windsor and explained in the March issue.—Ed.) The administrative cost of each infection case was $3.98 in 48% of the cases and $.28 in the remainder. The cost of overhead averaged $6.90.

Nurse's time, doctor's calls, medical supplies and hospital care were important items of medical expense in infection cases. The nurse's time cost an average of $.47 and medical supplies cost $.16. Doctor's calls were made in 65 per cent of the cases included in the study, the cost of each case ranging from $2.00 to $15.50. Forty-five per cent of the infection cases were hospitalized, the hospital bills ranging from $22.98 to $52.74. The average medical cost of infections was found to be $23.28.

Compensation ranging from $10.08 to $42.08 was paid in five cases. No permanent disability payment was made. *The grand total cost of infection cases ranged between $1.54 and $115.01 and averaged $39.04.*

Conclusion

Accidental injuries are costly to the employer, the injured man, his family, and to society in general. To the employer, occupational injuries are an important cost in production as shown in the series of articles concluded in this issue.

All figures used by Mr. Windsor in his final report are reliable and substantiated. They admit no room for questioning as far as their accuracy or authenticity is concerned because any information found to be incomplete or subjective was not used.

The report proves that all types of occupational injuries cost money to management. These costs were broken down into the various separate factors which were used to compute the total costs. Individual studies of various types of industrial accidents have been presented in the past issues of this magazine. Each study revealed the methods and means used to arrive at the final figures given in Mr. Windsor's "Cost of Accidents" report—figures which can be used by safety directors and engineers throughout industry as a yardstick to prove to top management the value of continuing and increasing the ways and means of preventing industrial injuries within their respective plants.

"78% Reduction in Time Loss from BURNS"

. . reports large manufacturer of Lime Products

R-52 Relieves Pain Quickly No Bandaging Required

R-52 relieves pain of burns in a few seconds; promotes fast healing. Its amazing new action has worked wonders for workers burned by hot metals and acids—in fact, it has proved effective for all types of burns.

Doctors in industry hail R-52 as a marvelous advance in burn treatment. "Dramatic in relieving pain; spectacular in healing properties," says an industrial user.

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The only way to appreciate R-52 is to try it. Speeds natural processes of healing. Write today on your company stationery, for our *special offer* for making a trial that can *save you thousands of dollars in lost employee hours*, as well as untold suffering.

PHARMACEUTICAL PREPARATIONS, INC.
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CEVASAL
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To prevent time loss
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To replace loss of salt
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CEVASAL tablets have proven to be effective in increasing work output. The enteric coating on CEVASAL eliminates stomach irritation generally associated with ordinary salt tablets.

Attractive single-tablet dispenser available; it hangs on wall near the water fountain.

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"FOR FIRST-AID KITS"
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...but *quick* first aid reduces danger of infection

24-Unit Kit

Use MSCo *Flexible Unit-Packed First Aid Kits* for every type of hazard or injury

The difference between a minor injury and costly infection can often be a few seconds lost in applying emergency first aid. That's why it pays to keep MSCo **Flexible Unit-Packed** First Aid Kits instantly available throughout your plant.

The average cost of one infection, as shown by the Le Tourneau, Inc., figures, **is greater than the cost of the most complete MSCo First Aid Kit.**

Antiseptic is always ready for quick application in MSCo antiseptic swabs and 3½ and 10 CC capillary applicators. The antiseptic of your medical department's choosing is hermetically sealed in glass ampoules protected by cardboard sleeves. Antiseptic stays at full strength until ampoule is crushed for individual application.

You can fit MSCo **Flexible Unit-Packed** First Aid Kits to the special needs of each department or operation. The MSCo Flexible Unit System is made up of more than 100 different kinds of units that can be assembled in kits to meet any occupational hazard.

Applications are individually packed in uniform packages. The unit packages fit into cases of welded 20-gauge steel. Each case has a rubber gasket that protects the contents from dirt and moisture. Every item is kept clean and sterile, ready for instant emergency use.

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HOLLYWOOD TURBAN

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Comply with A. R. A. Regulations when loading or unloading tank cars containing inflammable liquids
Clamps automatically to any size rail. Stays firmly in position and can be instantly released.
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Safety Equipment for all Industries
INDUSTRIAL PRODUCTS COMPANY
2830 N. FOURTH STREET • PHILADELPHIA 33, PA.

SMASHING T. B. WITH MASS X-RAYS
from page 29

hearts. It is hoped, therefore, that this screening may also provide the first warning that eventually may save many people from the principal cause of death in Washington and America. They are advised to see their private doctor or go to the heart clinic. There, rest and the proper treatment is advised. While control of heart disease is not the paramount purpose of this drive, it is expected that these findings will also save many lives.

In all cases referred to the Tuberculosis clinic, treated by the doctor of the clinic, or referred to his private physician, temperature, sputum examination, patch test, or other diagnostic means are used to confirm the X-ray diagnosis.

Prevention Important

Prevention is the most profitable investment in time and expense. Early diagnosis will save the person weeks of sick-bed expense and perhaps months of part-time income as well as possibly life itself. Early diagnosis will prevent his close companions at the trade or in the shop from being infected and going through the same loss of time, income and suffering.

The shop accident and liability rate is increased by the careless workman that does not sleep at night from his cough, or who carries about his tired-out feeling. Even the perfect mechanic cannot do his best if he is the victim of a regular but slight afternoon fever.

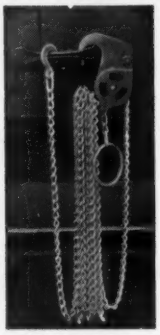
Cleanliness in the shop as in the home is a necessity, and in this infection where the spread is so easy and fatal, it must be borne in mind. Well-organized good - housekeeping pays doubly well in a better and more evenly produced and higher grade output.

Conclusion

It should now be possible by a mass drive of government, employer and employee on these three or four great killers and top foes of health—heart disease, cancer, tuberculosis, and accident—to materially increase the average span of life. These four causes of death take not only more lives but also destroy more property and bring more sickness than all the other dangers to which man is heir. They are also the four that government, employer and employee can best pull together to eradicate.

SAFER—FASTER BETTER WAYS TO OPEN BALKY BOX CAR DOORS!

NOLAN ONE MAN CAR DOOR OPENER



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One man can open the most binding, balky box car door with the Nolan Car Door Opener. Get greater safety . . speed loading and unloading schedules . . order an ample supply to fill your needs today!

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"PEP-UP"
SALT TABLETS

The Original Patented Enteric Coated Tablet

Will not cause Nausea or "Salt Sickness" — coating is moisture - proof and does not attract rodents or bugs of any kind. They look like candy and are easy to take, but are not sugar coated — can be purchased in economical, sanitary, factory-sealed "EXPENDABLE" Dispensers or in bulk.

"PEP-UP" Enteric-coated Tablets are produced only by the U. S. Safety Service Co., also manufacturers of the "SAF-I-SHIELD", the all-purpose safety goggle — the "SAF-CO-METER" Carbon Monoxide Indicator — "TUFFY" Aprons and stainless steel Weatherproof Salt Dispensers.

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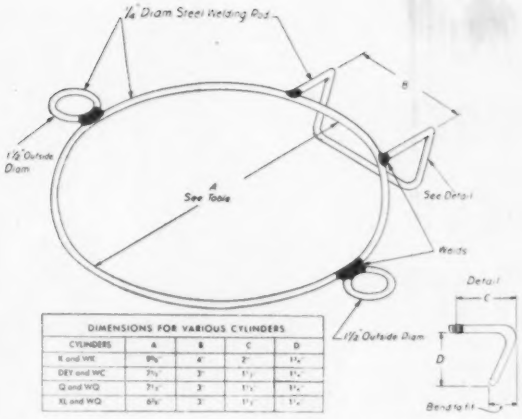
KEEP 'EM STANDING . . .

With this easily made Cylinder Clamp



DIMENSIONS FOR VARIOUS CYLINDERS				
CYLINDERS	A	B	C	D
K and WK	9⅝"	4"	2"	1⅞"
DEY and WC	7½"	3"	1½"	1⅞"
Q and WQ	7½"	3"	1½"	1⅞"
XL and WQ	6⅝"	3"	1½"	1⅞"

You can make this cylinder clamp from steel welding rod for about 15 cents—and it may save you several dollars damage to your regulator, or a personal injury. All you do is heat and shape the rod around a length of pipe and weld it as the sketch shows. The large ring fits around the oxygen cylinder and the hook clamps over the acetylene cylinder. When you chain or wire one of the small eyes to a pipe or pillar you have a sturdy anchor for your cylinders. This clamp will fit the "K" type oxygen cylinders and the "WK" type acetylene cylinders. You can alter the dimensions and make clamps for smaller cylinders too.—Courtesy, The Linde Air Products Co.

STOP
expensive eye injuries

Headrest Goggles W-50 with Filter Lenses for Gas Welding, Cutting, and Brazing

Type WR-50, same as above but with Elastic Head Band

Headrest Goggles G-50 with Clear Lenses for Chipping and Grinding

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Be sure . . . be safe! Keep eye accidents in check, all the time. Jackson goggles are a great investment in industrial safety. They give maximum protection, yet they are light to wear, simple to adjust, easy to raise and lower.

See your nearest Jackson dealer or write us.

JACKSON PRODUCTS WARREN MICHIGAN

the worst fires start when your plant is unprotected!

Syracuse, Indiana — Trailer Mfg.
1 dead; $600,000

Fire, confined to a storeroom when discovered by the watchman, spread to stocks of paint and lumber in a large 1-story factory. A neighbor assisting firemen was trapped within the building.

Dee, Oregon — Warehouse
$205,000

Flames discovered coming from the roof of a large 1-story wooden warehouse by a watchman at 3:45 A. M. spread to 1,400,000 ft. of lumber stored in the yard of a nearby sawmill.

Marion, Ohio — Conveyor Mfg.
$350,000

Fire believed caused by a defective water cooler motor spread to painting material stores nearby. At 4:15 A.M., outsiders discovered the flames out of control in the large area 1-story building.

Reports of the National Fire Protection Association, month after month, show that the most costly fires start at night. The basis for this is logical; a small fire starts . . . there is no one there to spot it or to put it out . . . undetected, it grows rapidly . . . then the watchman, or often a passerby, discovers it . . . too late.

The new C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a 24 hour a day automatic fire watchman. It provides the fastest type of fire protection known. The first whiff of smoke in a protected area sounds an alarm. Then fast, clean, non-damaging carbon dioxide blankets the fire, putting it out in seconds, before it spreads and causes extensive damage. C-O-TWO is safe as well as highly effective on flammable liquid and electrical equipment fires.

Be sure that your flammable liquid hazards, electrical equipment, record and storage vaults . . . all of your fire hazards are completely protected 24 hours a day. Let an expert C-O-TWO Fire Protection Engineer advise you on your fire protection needs now before fire strikes. Write today . . . tomorrow may be too late.

C-O-TWO

C-O-Two Fire Equipment Company

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

INDUSTRY NEWS
from Page 29

NEW LOCATION . . . Headquarters and plant of the Medical Supply Co., manufacturers of first aid kits and supplies, has been moved from Chicago to 1027 West State St., Rockford, Ill. Increased volume has made it necessary for the company to find larger quarters, according to Gordon St. Clair, President. The new plant at Rockford, says Mr. St. Clair, is an all-daylight plant. "We have made it one of the most modern and sanitary of its kind in the country, with new labor-saving devices such as adjustable work chairs and tables for reducing employee fatigue." Color dynamics have also been employed at the new plant.

ADVERTISING SAFETY . . . A campaign to increase safety in coal mines is being conducted by the Rome Cable Corporation in cooperation with mine operators. From the results of a survey with reference to mine cables, it was learned that cable and power failure and their accompanying fire hazards are quite often the result of mishandling cables. To emphasize to mine workers the dangers of mishandling cables, the corporation is producing a series of posters on proper cable handling. Campaign is being announced to the mining industry through advertisements and direct mail.

CORDLEY PROMOTION . . . C. M. Cordley, president of Cordley & Hayes, announced that Robert M.

Corby, who had formerly been their Service Manager, was recently appointed Eastern Regional Manager. Prior to joining Cordley, Bob Corby was a Naval engineering officer on minesweepers.

FIRE PROTECTION FOR INDUSTRY

A SECTION IN WHICH ARE PRESENTED THE VARIED SPECIALIZED PROBLEMS AND SOLUTIONS TO FIRE FIGHTING CONTROL AND PROTECTION IN INDUSTRY

Preventing Dust Explosions in Starch Factories 44

Where To Look for Spontaneous Ignition Hazards 46

Advertiser's Index 48

PREVENTING DUST EXPLOSIONS IN STARCH FACTORIES

The methods described here to prevent dust explosions in starch factories are also helpful in preventing explosions whenever dust accumulates during any kind of work process.

MANY factories make wet starch only for subsequent conversion to sugar or syrup, others produce starch only, others produce sugar, starch and dextrine. According to the Committee on Dust Explosion Hazards of the National Fire Protection Association, the explosion hazard appears in three places: first in the corn receiving and storage departments in the form of grain elevator dust; second, in the dust arising from the milling and storage of the so-called gluten feed; third, from the presence of starch dust. It is now generally accepted that any kind of starch dry enough to float in air, is dry enough to contribute to an explosion, even though the department may be one in which the air is quite humid.

Transfer of starch between buildings shall be only by cart over a tramway; or by enclosed spiral conveyors, equipped with a positive seal or choke, under wide shed roofs, or by enclosing galleries having sides at least 50 per cent open; or by other approved means.

All walls shall be finished smooth and irregularities of contour brought flush with the surface, or filled to reduce lodgement of dust to a minimum. It is recommended that these surfaces then be finished with white enamel paint. The surfaces of all posts shall be brought to conform to this standard. All ceilings and beams shall be smooth finished, without crevices or ledges or roughness, such as would provide attachment for dust. All floors shall be surfaced smooth with cement or composition, or shall be of wood finish without crevices or pockets offering lodgement for starch dust.

There shall be no floor openings other than those necessary for the spouts and bin openings. Crevices between floors and spouting shall be tightly closed with either hard or plastic cement to prevent drafts through the floor. Stairs and elevators shall be outside of the walls of the buildings with fire doors on communications at floor levels, or may be within the building, if enclosed by fire walls with fire doors on any stair or elevator opening into the building. Door openings to unenclosed outside stairs shall be protected by standard fire escape doors.

Operations in the kiln building shall be limited to charging, discharging, dumping and preliminary reeling of starch.

The starch dumps shall be under hoods of fire-resistive construction, ventilated by fans of sufficient power to prevent escape of dust when dumping, exhausting to water spray type collector, or cyclone or cloth dust collector, housed in fire-resistive shelters above the roof of the kiln house, or in other locations safely isolated from the building. (See Standards for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal, NBFU Pamphlet No. 91.)

Dry dust collecting systems for apparatus ahead of the mills shall be separate from the collecting systems for apparatus after the mills. The apparatus immediately after the mills should preferably have its own collecting system, which should be independent for each mill.

All starch before milling shall pass a one-half inch or smaller mesh screen, and approved magnetic separators, or shall be raised by air lift.

The grinding chambers and all parts within the grinding chambers of the mills should be of brass, bronze, or other non-sparking metals.

Control and Removal of Suspended Dust

All elevator legs, spouting, screw conveyors, stock hoppers, bins and grading machines shall be dust tight, and shall be equipped with mechanical exhaust to dust collectors so that dust will not escape from the apparatus under conditions of use and inspection. Each department shall have its own complete dust collecting system.

When a water spray type collector is used, it may be

within building. Collectors of cyclone type shall be vented directly outdoors or to a secondary system of similar collectors, which are vented to the outside air. If cloth collectors are used, they shall be located in fire-resistive housings on the roof of the building or at other locations safely isolated from the building. All wind trunking of such systems shall be of metal.

Dust escaping from filling machines or in hand filling operations shall be controlled by properly arranged collecting hoods connected with mechanical exhaust.

Removal of Static Dust

All surfaces on which dust settles shall be cleaned off sufficiently often to prevent the accumulation of a coating of dust.

The cleaning of surfaces shall be by vacuum sweeping apparatus, if it can feasibly be applied, and if not, shall be by soft brushes or wipers or mops of loose fabrics.

For removal of dust from motors, building should be equipped with a stationary compressed air system, operating at from 80 lbs. to 100 lbs. pressure. Fixed compressor piping systems shall be of extra heavy type, and the compressors and receivers shall be stationary and shall not be located in dusty departments. This apparatus shall not be used while department is operating.

Kiln tray repairing department shall be separated from adjacent occupancy, by dust tight fire-resistive partitions, and shall be daily cleared of starch dust accumulations.

Starch bags shall not be cleaned in the open, but may be cleaned by drawing over the nose of a draft spout, or by shaking them within an open top inclosure under mechanical draft sufficient to prevent the escape of the dust into the room, or by other completely enclosed bag cleaning device.

Prevention of Ignition

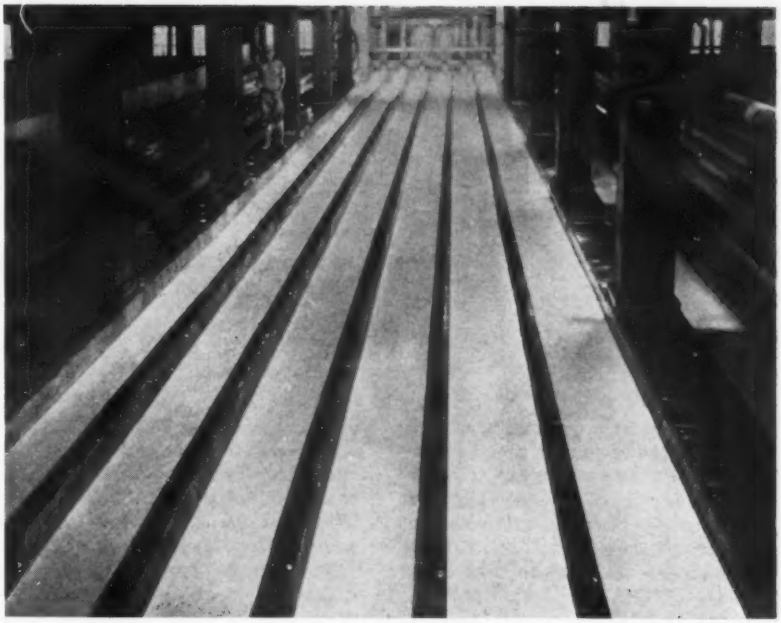
Open flames or igniting surfaces shall not be permitted nor should smoking and the carrying of matches be permitted.

Electrical equipment shall be installed in accordance with the national Electrical Code (NBFU Pamphlet No. 70), Article 500, which covers electric wiring and apparatus in dusty locations.

Static electricity shall be removed from such machines as accumulate a charge by permanent ground wires, and from belts by grounded metal combs or other equally efficient systems.

Fans and blowers shall be so constructed that fan blades cannot come in contact with fan housing. Bearings shall set well away from fan housing to prevent the forcing of grease to the inside of the fan housing or air chamber. (See Standards for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal (NBFU Pamphlet No. 91).

Ball or roller bearings should be used whenever practical, otherwise ring, chain or roller oiler bearings should be used.



A view inside a starch factory. Shown are starch tables, long tilted troughs which separate starch from gluten.

Mechanical Precautions

Unless ball or roller bearings are employed the speed of revolution of spiral conveyors shall not exceed 100 r.p.m. and graphite buttons or other suitable material shall be inserted in the bearing surfaces of all sleeve bearings. When feasible the upper half of the sleeve bearing may be removed to permit the stock to move freely over the bearing surfaces.

A conveyor choke or seal of proper design should be installed to prevent explosions in conveyor systems from propagating from one building to another.

All elevator legs shall be equipped with an automatic overload release or a signal system, which will register when the leg begins to slow down, thus indicating to the operator the possibility of choke at the boot.

Housekeeping

All of the departments devoted to the handling and packing of dry starch shall be kept free of stored material of every sort, other than starch which has just been packed and is about to be removed to the warehouse. This requirement embraces new and discarded machinery and parts not in use and pieces of apparatus.

Efficient help and methods shall be employed to prevent miscellaneous dust clouds and to keep the departments clean at all times, and no accumulations of starch dust shall be permitted on any surfaces, other than those immediately about places where starch is being handled in the open. The word "accumulation" as used here, is to be interpreted as that amount of dust which is sufficient to obscure the view of the surface. All spills of starch from apparatus, and accumulations gathered in cleaning of surfaces, shall be shoveled up and sacked as made, and removed from building or to a recovery department, or else returned to the stream of starch in process where trade practice permits.

WHERE TO LOOK FOR SP

. . .as suggested by M

BASED on Factory Mutual experience, seven percent of all industrial fires are reported due to spontaneous ignition. Because fire from this cause is likely to start when no one is on hand to extinguish it in its early stages, the amount of damage is large—11% of the damage from all fires.

Commonly used materials which may heat spontaneously at normal temperatures, or slightly higher include: (1) *vegetable oils* such as linseed, cottonseed, cocoanut, palm, olive, peanut, soy bean, corn, perilla, pine, and tung oil; (2) *animal oils* including lard, tallow, lanolin, and fish oils; (3) certain *solids* including soft coal, lamp black, charcoal, rubber, and iron pyrites; and (4) *vegetable and animal fibres* such as flax, jute, wool, and hay, under some conditions, particularly when damp. All forms of fermenting or decaying organic matter produce heat, although temperatures seldom become high enough to result in ignition.

For spontaneous ignition to occur, two conditions are necessary: (1) oxidation must take place in the material, and (2) heat of oxidation must be produced faster than it is dissipated. Because oxidation takes place generally on the surface of the material, the tendency of a liquid to heat spontaneously is greater when it is spread in a thin film, and of a solid when pulverized. Also, confining or insulating a material helps to retain the heat of oxidation and increases the chance of ignition.

To illustrate the above principles, linseed oil in an open can does not catch fire because relatively little surface is exposed to the air and oxidation proceeds slowly. Spread on a thin layer of loose waste exposed to the air, the oil will oxidize faster but the heat will be dissipated rapidly, and the waste will not ignite. The same waste, confined in the bottom of a pile in a corner, will retain the heat and finally catch fire.

Another condition which promotes spontaneous ignition is high temperature. In general, the rate of oxidation (and the production of heat) increases in proportion to the rise in temperature. Many materials which may be stored safely at room temperatures will heat spontaneously and ignite after prolonged exposure to high temperatures in ovens, ducts, or near heating pipes.

The following material outlines some common examples of spontaneous heating.

Paints, Lacquers, Varnishes

Many paints, laquers, japans, and varnishes contain drying oils which heat spontaneously. Paint-soaked rags or cloths present real danger. One striking example occurred when painters left their ladders, drop cloths, and paint cans in a hospital utility room overnight; next morning, they discovered that all the combustible material had been consumed by fire due to spontaneous ignition. The concrete construction had confined the fire to the room. About the same time, a large gymnasium of part wood construction at a boys' school was completely destroyed by painters' carelessness in disposing of their oily rags.

Industry's greatest fire — [illegible] mill
chusetts in 1941 — started [illegible]eous

Rubbish and Oily Rags

Rubbish or oily rags carelessly thrown into out-of-the-way corners, under tables or benches, or left in lockers, wooden boxes, barrels, or waste paper cartons, frequently ignite spontaneously. Practices such as leaving rubbish overnight in uncovered barrels or similar containers start many fires. Prevention of this type of fire requires a carefully worked out waste disposal program.

. . spray booths . . .

baled waste-paper . . .

SPONTANEOUS IGNITION HAZARDS

gested by Mutual Record

t fire — mill in Fall River, Massa-
— started ous ignition in a dryer.

Approved waste cans should be used for any materials which may ignite spontaneously. They have self-closing covers so that fire will not spread if heating occurs. The cans should be emptied daily, and all waste and sweepings burned in a properly designed incinerator, trucked away to a dump, or otherwise safely disposed.

Spray Booths, Ovens, Ducts

Dirty spray booths and ducts are notorious breeding places for fires due to spontaneous ignition. Paint deposits permitted to accumulate in spray booths cause many such fires. Paint residue accumulating on the roof of a spray building at one plant ignited spontaneously, spread over smooth surface roofing, and ignited residue in spray booth stacks. In another typical instance, lacquer residue from a spray booth was left in a near-by barrel instead of being immediately removed from the building; it ignited spontaneously during the night and, although two sprinklers quickly put out the fire, water leaked through plank floors and caused extensive damage. This hazard of spontaneous ignition makes it especially important to keep booths and ducts clean, and to protect them with sprinklers. Water-wash booths eliminate deposits and are safer than those of the dry type.

In industrial dryers and ovens, the normal spontaneous heating tendency of a material is greatly accelerated by high temperature. Typical was the spontaneous ignition of residue which had been permitted to accumulate on racks supporting enamel-dipped conduits in a large gas-heated oven; when an operator opened the oven doors, a burst of flame ignited the asphalt-coated metal wall of the building and a $100,000 fire resulted.

Hot ducts at ovens or similar equipment promote spontaneous heating of accumulated deposits. At a can plant, an exhaust duct for a conveyor oven handling lacquer-coated metal sheets had not been cleaned, lacquer deposits ignited, and fire wrecked the duct.

Storages That May Heat

Bituminous coal is one example of several types of materials that are stored at plants and have a tendency to heat spontaneously. It absorbs oxygen from the air. If the heat of oxidation is not conducted away, the coal may start to burn. Excess sulfur and moisture promote spontaneous heating, so it is important to buy coal low in sulfur content, preferably not over 1%. Access of oxygen to the interior of a pile is prevented by the recommended method of piling in layers and compacting solidly with a tractor after each layer is laid down.

Storages of textile waste sometimes heat spontaneously. A typical example involved oily sweeps from the card and spinning rooms of a cotton mill, stored with higher grade waste in a large unsprinklered shed. The waste ignited spontaneously at night, destroying the combustible shed and over 500 bales of waste. Another plant had repeated fires in baled wool waste. The trouble was traced to heating of peanut oil used in conditioning the wool. A safer oil was substitued and fires stopped.

Shortages of baled waste paper are frequently subject to spontaneous heating, particularly in the low grades which are likely to contain oily rags, lunch scraps, or other foreign material. Because paper is a

. . . oily waste . . .

ducts

good insulating material, heat may build up until ignition occurs. If fire breaks out in a pile of waste paper which has been in storage for some time, it is highly probable that spontaneous ignition is the cause. One paper-board plant which experienced two waste paper storage fires in a week definitely traced the cause to trimmings which had been sprayed with cedar oil.

Storage of any material having a spontaneous ignition hazard endangers other materials near by. Such storage should, therefore, be segregated, and arranged in low well-separated piles under sprinkler protection. Some materials, perhaps, may be best stored in a safe yard location.

Spontaneous Heating in Processes

Many materials and finishes in drying and baking processes are subject to spontaneous heating. Paints or other finishes are probably the worst offenders. Keep dryers and ducts clean and avoid excessively high temperatures.

Rubber may also give trouble. At one plant, fires broke out repeatedly in a conveyor dryer handling ground reclaimed rubber until guards were provided to prevent rubber particles from falling between the edge of the conveyor and the dryer wall onto steam coils, and igniting spontaneously there. Some types of sheet rubber, sponge rubber, and latex-coated materials may also ignite spontaneously in dryers or curing ovens unless conditions are carefully controlled.

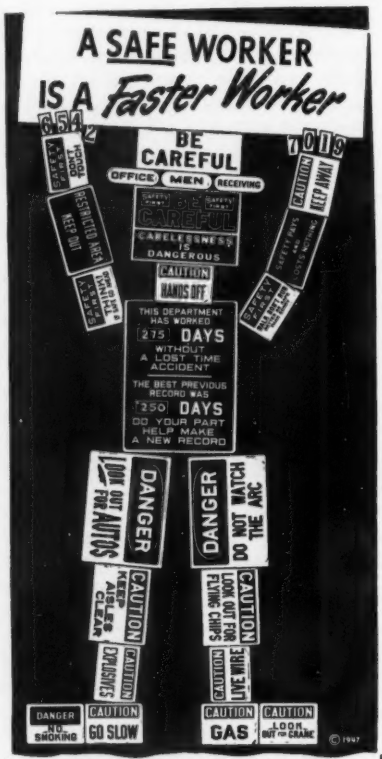
Sulfur-dyed cotton requires careful handling. One mill had eight fires within three years at a dryer processing this material. Fires stopped when a steam pressure reducing valve was installed to hold dryer temperatures at a safe level, and careful attention was given to washing the dyed stock (the desired neutral condition of the final rinse may easily be determined by means of a simple pH color indicator).

In the manufacture of cork insulation blocks, superheated steam is passed through ground cork to soften the resins in the cork which act as a binder. This curing process evolves heat, and unless carefully controlled, heat may build up in freshly formed blocks until fire breaks out. One plant suffered four serious fires of this type.

Even freshly washed and dried laundry has been known to contain materials which ignite spontaneously. In one recent case, fire broke out in a lot of laundry shortly after it was removed from a tumbler dryer to a wooden tote box. The fire had started in a bath mat whose rubberized, non-slip backing had heated spontaneously.

Let materials susceptible to spontaneous heating cool to room temperature in thin layers or well spread out before storing in bulk.

Maintaining clean conditions and safely disposing of waste materials will prevent most spontaneous ignition fires. It will also eliminate ready fuel for fires from other ignition sources.



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M·S·A FOILLE BURN SPRAY KIT

Perfectly adapted to emergency requirements, this complete burn kit contains an ample supply of Foille for Burns in jars which connect directly to efficient metal spray gun. Just a few strokes of pump handle enables rapid spray coverage of injured area with pain-relieving, soothing Foille. Unit-packaged first aid accessories, scissors, etc., and sterilized muslin sheet are included. Bulletin FB-84.

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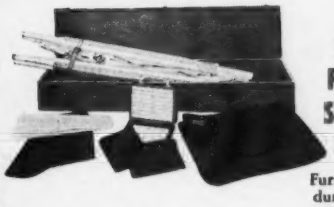

M·S·A FOLDING STRETCHER OUTFIT

Furnished in a compact, durable steel case, new-type folding stretcher opens quickly to full army size. Stretcher cover is 12 ounce duck, frame is selected dried ash, and all metal parts of malleable iron. Outfit includes a wool and a rubber blanket, four wood splints, two chemical hot pads and one 16-unit First Aid Kit. Case is finished in red crackle enamel with white lettering. Handles at both ends and brackets for mounting are standard. Overall dimensions are 56" x 12¾" x 8" Write for details.

M·S·A SNAKE BITE KIT

This new plastic snake bite kit weighs only 3½ ounces complete; can easily be carried in shirt pocket. It contains every essential for correct, modern treatment of snake bite. Self-suction pump requires use of but one hand—removes venom from wound. Incising knife, tourniquet, iodine brush, ammonia inhalants, compresses and pump ring adapters are included. Bulletin No. FA-96.

M·S·A All-Weather FIRST AID KITS

Portable dispensaries for the rapid, safe treatment of injuries on the job! Containing complete assortments of unit-packaged first aid materials, these Kits are built of sturdy steel and have soft molded rubber gaskets which exclude dust, dirt and moisture.

Each package contains correct treatments for one or more specific types of injury and has printed picture and instructions on cover. All dressings are sterile; all liquids are hermetically sealed to prevent leakage and deterioration. Kits are available in 10, 16, 24 and 36-unit size cases, may be obtained with standard or special fills, and are equipped with snap locks, carrying handle, and brackets for mounting.

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Typical sealed visual antiseptic swab—just crush and apply

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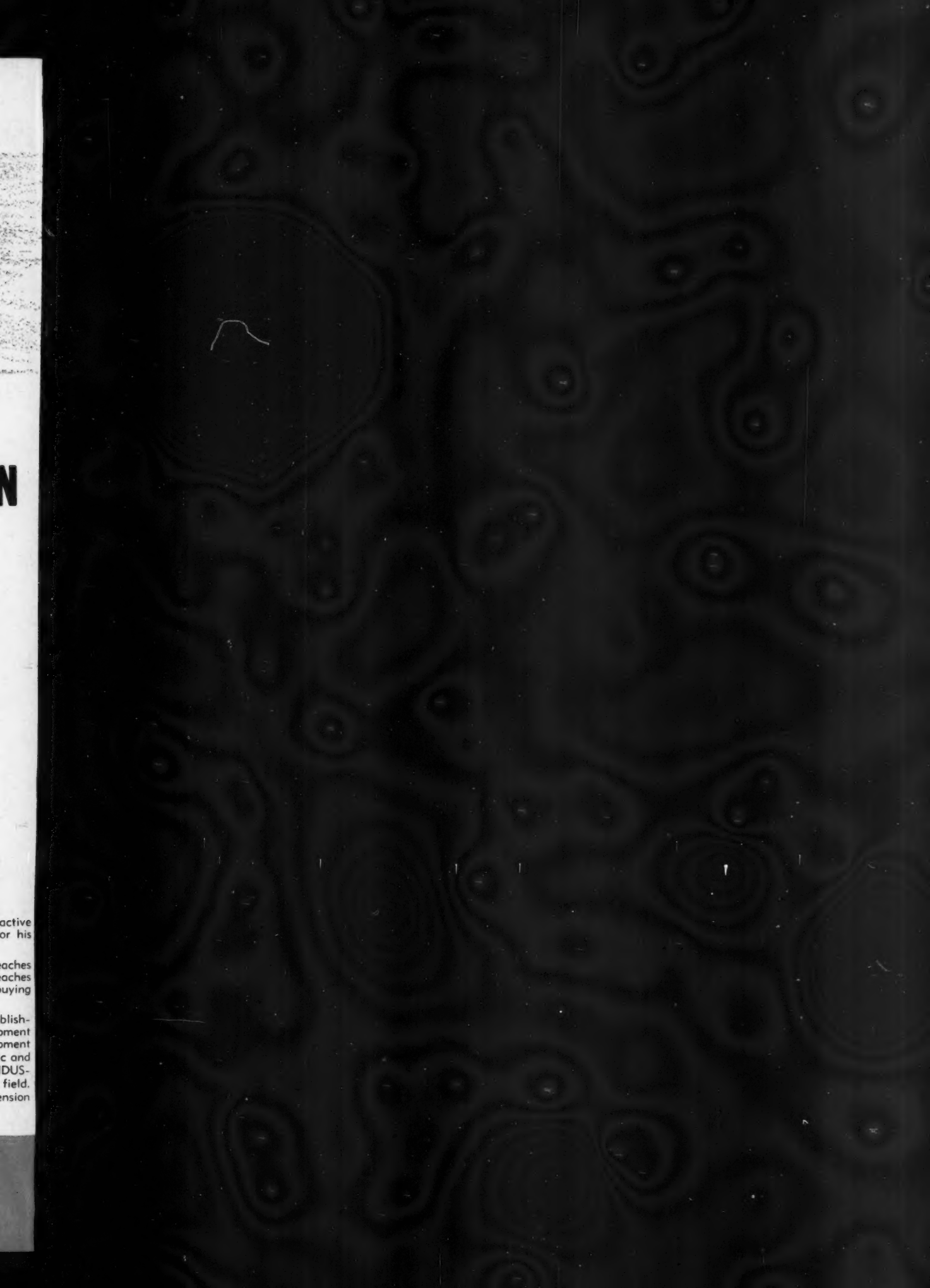
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